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Canadian Pulp and Paper Association Meets

Paper Men of Dominion At Annual Convention At Montreal Re-elect F. G. Robinson President—Prominent American Paper Men Present — Program Included Technical and Educational Topics.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 3, 1941—The annual Convention of the Canadian Pulp and Paper Association, which was brought to a close here on Friday last, was, as always, very largely attended not only by executives in the industry, but by experts in its various fields of activity from all over the country, as well as by a number of guests from the United States. A full program covering three days, and embodying many papers and discussions of a technical and educational nature, had been drawn up, and was carried out in both open and sectional meetings under the general supervision of the president of the Association, F. G. Robinson, vice-president of the Canadian International Paper Company, ably assisted by the Secretary-Manager, A. E. Cadman. In view of the war, the conviviality usually accompanying the proceedings was dispensed with, there being no annual banquet and no entertainment. The members met at luncheon on the three days, and at these the addresses were concerned with problems immediately confronting the industry.

President Robinson's Address

In his annual report at the general meeting of the Association, F. G. Robinson, president, spoke of the splendid cooperation he had had from all in the ideal he set forth on accepting office, as follows:

"Let us see to it that the Association represents the Industry with unanimity, and with dignity and effectiveness, in its relationships to the community at large, and its representative governments, so that in our time we may enhance the widespread contributions this Industry makes continuously for the betterment of Canada's national economy, and hand it on sound and strong to the next generation." He continued:

The duties of the administrative staff of the Association have been re-distributed; its organization strengthened by creation of the office of Assistant Secretary. The Secretary-Manager, Mr. A. E. Cadman, has been given additional much needed relief by the appointment of a Technical Secretary by the Technical Section, who will undertake his duties shortly; and the appointment of a Secretary of the Pulp and Paper Research Institute of Canada. A complete survey was made of Association statistics, resulting in the appointment last September of a competent statistician. It can be reported that the administrative re-organization is completed in its broad phases, and is now functioning effectively.

After many thoughtful discussions in perfect harmony between the parties interested, a new agreement for five years was made operative as of August 1st between the Dominion Government, McGill University, and the Association, whereby the administration of the Pulp and Paper Research Institute of Canada is vested in a Joint Administrative Committee. The executive direction of its operations is vested in and controlled by a Director. We are indeed fortunate that Dr. Otto Maass, Chairman of the Department of Chemistry, McGill University, accepted this office. The results of his unselfish energy, organizing and directive ability, are already abundantly evident. He is ably assisted by Dr. W. B. Campbell, Director of Technical Research.

Both the Technical and Woodlands Sections have set up small Research Committees to co-ordinate their activities through the Director of the Research Institute, so integrating all research and development activities of the Association.

Membership in good standing at December 31st comprises: 50 Member Companies, 12 Associate Members. These 62 companies constitute close to 95 per cent of the Canadian production of pulp and paper; the remaining producers co-operate informally with the Association on major matters of common interest. It may thus be said that virtually the whole Industry is represented by this Association and the Newsprint Association.

Dealing with the support the Association had given to many projects to further the war effort, he mentioned the organization of accumulating, reconditioning, and making into blankets discarded machine

(Continued on page 16)

Employment Up 6.6 Per Cent in Wisconsin

Paper Mills and Allied Manufacturing Plants Report Gain In Number of Workers and Increase In Payrolls With Average Weekly Earnings of $27.76—Tomahawk Sells Lands—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 3, 1941—Employment in the paper mills and allied industries of Wisconsin reached the highest point in two years in June, 1940, when 21,900 workers were on the weekly payrolls, and has maintained that position since, according to comparative summaries prepared by the statistical division of the Wisconsin Industrial Commission.

The highest point of 1940 was reached in July when 22,300 workers were reported. In September the number tapered off to 22,200, in October it was 22,000 and in November and December 21,900.

Total weekly payrolls followed the same trend, reaching $577,000 in June, 1940, $581,000 in July, $595,000 in August, $589,000 in September, $587,000 in October, $579,000 in November, and a new high for the years 1939 and 1940 in December, with $607,000, reflecting wage increases granted in numerous mills.

Mill Employment up 6.6 in 1940

The average number of workers on the payrolls was 20,300 for 1939 and 21,700 for 1940, a gain of 6.6 per cent. Weekly payrolls averaged $518,000 for 1939 and $566,000 for 1940, a gain of 9.2 per cent. The average employee-hours per week advanced 1.9 per cent, from 865,000 in 1930 to 881,000 in 1940. There was also a gain in the average weekly earnings, from $25.50 in 1939 to $26.12 in 1940. There was a decline, however, in the average number of hours worked per week, from 42.6 in 1939 to 40.7 in 1940, reflecting enforcement of the wage-hour law and the 40-hour work week.

Average earnings per worker per week during the last three months of 1940 reached a figure of $27.76, the largest in the two-year period, for an average work-week of 42 hours. The hourly rate stood at 66.1 cents for the last quarter, the highest in 1939 or 1940. While the estimated number of wage earners declined 0.1 per cent from October to December, 1940, inclusive, the estimated weekly payrolls climbed 4.9 per cent, from $587,000 in October to $607,000 in December.

To what extent the paper industry has been responsible for increased employment is shown by a comparison in Wisconsin cities for the years 1939 and 1940. In every paper center there has been a gain: Appleton, 8 per cent; Green Bay, 3.3 per cent; Marinette, 9.1; Menasha, 4.2; Neenah 14.4; Rhinelander, 3; Stevens Point, 8; Wausau, 17.3, and Wisconsin Rapids, 8.1.

Tomahawk Sells Forest Lands

Tomahawk Kraft Paper Company, Tomahawk, Wis., completed a deal last week whereby it sold to the State of Wisconsin approximately 19,200 acres of forest lands on both sides of the Flambeau River in Rusk and Sawyer Counties of Wisconsin. The basic price was $1.00 per acre plus stumpage value, and although the company asked $55,000, an offer of $50,000 made by Gov. Julius P. Heil was accepted. S. B. Bugge, general manager, and C. G. Laren, chief forester, represented the company in making the transaction. The land was wanted by the state for the creation of a new state park in the Flambeau River area. Originally, the company wanted to trade the property for state-owned forest lands next to the Tomahawk holdings in Oneida County, but a controversy over values caused this deal to be dropped.

Paper Mills Oppose Minimum Water Level

Opposition was registered by paper mill and water power representatives at a hearing at Stevens Point last week to a petition of the Stratford Rod and Gun Club, Stratford, Wis., demanding the establishment of an increased minimum water level in the Big Eau Pleine River reservoir near Knowlton, Wis. The hearing was conducted by the Wisconsin Public Service Commission, which has the petition under advisement.

Sportsmen alleged that the forced lowering of water levels had caused considerable loss of fish life, and that fishing conditions in the reservoir were becoming worse each year.

Warren E. Brooks, vice-president and general manager of the Wisconsin Valley Improvement Company, which operates the water control dams on the Wisconsin River for the papers mills, declared that the legislative act authorizing the reservoir set limitations of 1,145 and 1,115 feet respectively, to permit a legal withdrawal of 30 feet of water. He described conditions in the river prior to construction of the reservoir, saying that during low water stages fish life was confined to a limited number of pools badly infested with carp. He also declared that construction and improvement costs of the dam were in excess of $800,000, and that employment in five paper mills using the water for generating power had increased to more than 3,400 men, from less than 2,200 in the last 14 years.

"The Improvement Company paid $700,000 for a reservoir based on this useful capacity (4,051 million cubic feet)," said Mr. Brooks, "and established its gauge at the dam, allowing a variation of 30 feet as determined by the legal limits fixed by the Legislature.

Mr. Brooks and W. F. Thiele, chief engineer of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., which built the dam, introduced testimony that lowering of the water last spring was the cause of little loss of game fish, but that considerable quantities of carp, the removal of which costs thousands of dollars annually, were found dead in pools. Their testimony was corroborated by K. J. Hubbard, electrician for the Consolidated company. Mr. Brooks and Mr. Thiele also declared that an annual loss of $50,000 in operating revenues would accrue to the company if it were obliged to increase its minimum water head at the dam five feet, as was suggested in several instances. T. W. Brabeau of Wisconsin Rapids, appeared as counsel for the Consolidated company.

Tentative Program for "Paper Week"

The American Paper and Pulp Association has just issued the tentative program for its 64th annual meeting. All the meetings of the association, together with the allied associations, will be held February 17-21 at the Waldorf-Astoria Hotel, unless otherwise indicated in the program. The Technical Association of the Pulp and Paper Industry will meet at the Roosevelt Hotel and its program is printed elsewhere in this issue as is the program of the National Paper Trade Association.

The association wishes to call attention especially to the fact that by direction of the executive committee and board of governors, an Industry Luncheon is being held on Monday, February 17. This luncheon is for the specific purpose of placing before the industry the work in which the association is faced in the future concerning which industry understanding seems essential.

Sunday, February 16, 1941

10:00 A.M. Institute of Paper Chemistry, Board of Trustees (Barclay Hotel).
10:00 A.M. United States Pulp Producers Association, Annual Meeting.
1:00 P.M. United States Pulp Producers Association, Luncheon.
2:00 P.M. United States Pulp Producers Association, Annual Meeting Continued.
2:30 P.M. Writing Paper Manufacturers Association, Technical Committee.

Monday, February 17, 1941

8:00 A.M. American Paper and Pulp Association, Finance Committee—Breakfast.
9:30 A.M. American Paper and Pulp Association, Technical Committee.
9:30 A.M. Sulphite Paper Manufacturers Association, Budget Committee.
9:30 A.M. Sulphite Paper Manufacturers Association, Nominating Committee.
10:00 A.M. Blotting Paper Manufacturers Association, General Meeting.
10:00 A.M. Glazed and Fancy Paper Association, Annual Meeting (Commodore Hotel).
10:00 A.M. Groundwood Paper Manufacturers Association, Annual Meeting.
10:00 A.M. Kraft Paper Association, Executive Committee.
10:00 A.M. The Tissue Association, Joint Meeting, Roll Toilet, Interfold Toilet and Paper Towel Divisions.
10:00 A.M. Writing Paper Manufacturers Association, Executive Committee.
10:30 A.M. Sulphite Paper Manufacturers Association, Board of Governors.
12:00 NOON (to 12:45) Association of Pulp Consumers.
12:30 P.M. Glazed and Fancy Paper Association—Luncheon (Commodore Hotel).
1:00 P.M. American Paper and Pulp Association, Luncheon Meeting.
2:30 P.M. The Tissue Association, General Meeting followed by Meeting of Incoming Board of Governors.
3:00 P.M. Groundwood Paper Manufacturers Association, Annual Meeting Continued.
3:00 P.M. Kraft Paper Association, Annual Meeting.
3:00 P.M. Specialty Paper and Board Affiliates, Lined Board Group.
3:00 P.M. Sulphite Paper Manufacturers Association, Annual Meeting.
3:30 P.M. Specialty Paper and Board Affiliates, Tag Group.
4:30 P.M. American Paper and Pulp Association, Committee on Coordination of Research.
4:30 P.M. Salesmen's Association of the Pulp Industry, Executive Committee and Advisory Board.
5:00 P.M. Salesmen's Association of the Paper Industry, Annual Meeting.
6:00 P.M. Sulphite Paper Manufacturers Association, Waxing Group—Dinner Meeting.

Tuesday, February 18, 1941

8:00 A.M. American Paper and Pulp Association, Nominating Committee—Breakfast.
10:00 A.M. American Paper and Pulp Association, Committee in Instrumentation Research.
10:00 A.M. American Paper and Pulp Association, Committee on Public Affairs.
10:00 A.M. American Waxed Paper Association, Annual Meeting.
10:00 A.M. Cardboard Manufacturers Association, —followed by Group Meetings.
10:00 A.M. Specialty Paper and Board Affiliates, File Folder Group.
10:00 A.M. Sulphite Paper Manufacturers Association, Unbleached Group.
10:00 A.M. Writing Paper Manufacturers Association, 80th Annual Meeting.
11:00 A.M. American Paper and Pulp Association, Committee on Stream Pollution.
11:00 A.M. Specialty Paper and Board Affiliates, Bogus Bristol Group.
12:30 P.M. Salesmen's Association of the Paper Industry, Annual Luncheon.
1:00 P.M. American Waxed Paper Association, Luncheon.
2:30 P.M. American Waxed Paper Association, Annual Meeting Continued.
3:00 P.M. American Paper and Pulp Association, Waste Utilization Committee.
3:00 P.M. Sulphite Paper Manufacturers Association, Manila Group.
3:30 P.M. Advisory Committee for the Pulp and Paper Industry to the Council of National Defense.
3:30 P.M. Specialty Paper and Board Affiliates, Mill Blanks Group.
7:00 P.M. Writing Paper Manufacturers Association, 80th Anniversary Dinner (St. Regis Hotel).

Wednesday, February 19, 1941

9:00 A.M. American Paper and Pulp Association, Biological Control Committee.

9:00 A.M. Glassine and Greaseproof Manufacturers Association, Executive Committee.
9:30 A.M. Glassine and Greaseproof Manufacturers Association, Annual Meeting.
10:00 A.M. Association of Newsprint Manufacturers of the United States.
10:00 A.M. Writing Paper Manufacturers Association, Cover and Text Paper Group.
10:30 A.M. American Paper and Pulp Association, Executive Committee and Board of Governors, Joint Meeting.
11:00 A.M. Specialty Paper and Board Affiliates, Executive Committee.
12:00 NOON Specialty Paper and Board Affiliates, General Meeting.
12:30 P.M. Bristol Board Manufacturers Group, Executive Committee—Luncheon.
1:00 P.M. Glassine and Greaseproof Manufacturers Association, Luncheon.
1:00 P.M. Specialty Paper and Board Affiliates, Luncheon.
2:00 P.M. American Paper and Pulp Association, Open Forum on Labor Relations.
2:30 P.M. American Paper and Pulp Association, Committee on Classification and Definitions.
2:30 P.M. Bristol Board Manufacturers Group, General Meeting.
3:00 P.M. Association of Pulp Consumers.
3:00 P.M. Sulphite Paper Manufacturers Association, Bleached Kraft Group.
3:30 P.M. American Paper and Pulp Association, Forestry Committee.
6:00 P.M. Sulphite Paper Manufacturers Association, Machine Glazed Group — Dinner Meeting.
7:00 P.M. Paper and Twine Club Dinner.

Thursday, February 20, 1941

9:30 A.M. American Pulpwood Association, Annual Meeting followed by New Directors' Meeting.
10:00 A.M. Sulphite Paper Manufacturers Association, Treated Butchers Group.
12:30 P.M. Vegetable Parchment Manufacturers Association, Annual Meeting and Luncheon.
1:00 P.M. Technical Association of the Pulp and Paper Industry, Annual Luncheon — (Roosevelt Hotel).
1:30 P.M. American Pulpwood Association — Luncheon.

Rittenhouse Salesmen to Meet

The Rittenhouse Association of Philadelphia Paper Salesmen will hold its next luncheon meeting on February 7 at the Adelphia Hotel, 13th and Chestnut streets, Philadelphia, Pa. The speaker will be H. C. Roemer of the Standard Oil Company of Pennsylvania who will present his famed "The Colossus of Roads". Much has been said and written about it . . . the Pennsylvania Turnpike.

Mr. Roemer will also present a swift talking motion picture showing the most spectacular phases of the road's construction . . . including the huge job of boring seven miles of tunnels through mountains of solid rock; biting through clear cut . . . the biggest excavation job here since the Panama Canal.

New Rogers Knife Grinder

The new Rogers Type "NT" cabinet base knife grinder has been designed of generous size and sturdily constructed to provide greatly increased production with marked savings in grinding costs.

The extra heavy base is cast as a single unit, is rigid and heavily braced with cross girths. The ways are automatically lubricated by a special power-driven oil pump. The base supports the table and knife bar on a surface, and flat way, which takes up its own wear. A speed of 28 feet per minute is standard but higher speeds are obtainable. The

SUPER DUTY CABINET BASE KNIFE GRINDER

grinder is also made with hydraulic table transverse.

Transmission is by a special double disc, wet, clutch-gear, plate mounted for accessibility. Feeds are by hand or automatic. A 5 h.p. splash-proof motor drives the grinding head. Motor is mounted to take up wear, with controls handy for the operator.

The grinding head is mounted on ball bearings. The knife bar is of extra heavy design, with two work surfaces; one for shear and other heavy blades and the other for thin blades. The knife bar is strongly supported and is adjustable for any angle by a hand wheel and graduated.

Standard equipment includes a self-contained water supply with motor driven pump. A 14-inch segmental type grinding wheel is adjustable for wear. An emery wheel dresser can be furnished at slight additional cost.

The New Rogers "NT", cabinet base grinder is furnished in four standard sizes: 70, 90, 110 and 132 inches, with larger sizes on special order. The estimated weight of the 90-inch size is 4800 pounds. Further details may be obtained from the manufacturer, Samuel C. Rogers & Co., 202 Dutton avenue, Buffalo, N. Y.

TAPPI Annual Meeting Tentative Program

Roosevelt Hotel, New York, N. Y., February 17-20, 1941

Program of Monday, February 17, 1941

9:30 A. M. GENERAL SESSION
W. H. Swanson, Chairman

Secretary's Report by R. G. Macdonald
President's Address by W. H. Swanson
Business Session

PAPERS:

Relation between Chain Length Distribution Curve and Tenacity, by H. Mark.
Status of the Lignin Problem, by Harold Hibbert.

2:00 P. M. WATER SESSION
L. B. Miller, Chairman

1. *Use of Sveen Glue and Its Effect on the Water in the Paper Mill,* by R. Tutt, Jr.
2. *Conditioning Water with the Spaulding Precipitator,* by Eskel Nordell.
3. *Water Treatment at Escanaba Paper Mill,* by I. W. Johnston.
4. *Water Treatment at the National Container Company Mill,* by Rudolph Richter and F. J. Lammers.
5. *Chemical Coagulants for Water Treatment,* by L. B. Miller.

2:00 P. M. MATERIALS OF CONSTRUCTION
J. A. Lee, Chairman

1. *Monel Jordan Fillings,* by T. E. Lagerstrom, F. P. Huston, and W. F. Burchfield.
2. *Meeting Present Day Requirements for Antifriction Bearings on Paper Machines,* by B. R. Sackett and C. N. Benson.
3. *Factors in Fourdrinier Wire Corrosion,* by H. G. Specht.
4. *Round-Table Discussion on Mill Piping* led by S. B. Jones.
5. *Round-Table Discussion on Packing Materials* led by J. W. Hemphill.
6. *Use of Rubberized Equipment for Resistance to Corrosion,* by J. F. Amlicke. (by title).

2:00 P. M. FUNDAMENTAL RESEARCH
H. F. Lewis, Chairman

1. *Determination of Cellulose in Wood by the Use of Ethanolamine,* by Philip Bloom and E. C. Jahn.
2. *The Relation of the Chemical Composition of Filler Pulps and the Color of White Urea Formaldehyde Plastics,* by Harry F. Lewis and George W. Ingle.
3. *The Colloidal Differentiation of Starches,* by Harold H. Houtz.
4. *The Colloidal Behavior of Soap-Starch Systems with Special Reference to Viscosity Effects and Starch Differentiation,* by Alfred M. Heald.
5. *Electrokinetic Phenomena of Aqueous Clay Suspensions,* by Karl W. Fries. (by title).

Program of Tuesday, February 18, 1941

9:30 A. M. PREPARATION OF NONFIBROUS MATERIALS
C. M. Connor, Chairman

1. *Prosize and Certain Aspects of Rosin Sizing,* by H. J. Hotz, T. T. Collins, and H. L. Davis.
2. *The Trend in Resins,* by J. F. Maguire and J. G. Rote.
3. *The Use of Urea Formaldehyde Resins for Wet Strength Paper Production,* by Philip B. Taft.
4. *Stabelite Resin—A Hydrogenated Rosin for Sizing,* by J. H. Long and A. C. Dreshfield.
5. *Polyvinyl Alcohol,* by G. L. Schwartz and P. J. Carlisle.

9:30 A. M. ACID PULPING
H. A. DuBois, Chairman

1. *Continuous Cutting Chippers,* by N. P. Wardwell.
2. *Comparisons of Sodium and Calcium Base Sulphite Acids,* by M. O. Schur and R. E. Baker.
3. *Effects of Heartwood Decay in Western Hemlock on Sulphite Pulp,* by W. F. Holzer.
4. *Sulphite Pulp from Douglas Fir,* by G. H. Chidester and J. N. McGovern.

9:30 A. M. ALKALINE PULPING
Paul Hodges, Chairman

1. *Kraft Pulping with Low Sulphidity,* by S. D. Wells and K. A. Arnold.
2. *The Use of Gypsum in the Kraft Process,* by Otto Kress and W. H. Aiken.
3. *Cottrell Precipitator in the Kraft Industry,* by L. M. Roberts.
4. *Operating Data on the Combustion Engineering Recovery System,* by F. H. Rosencrants.
5. *Performance of Evaporators,* by J. P. Rubush and G. E. Seavoy.
6. *Heat Transfer Coefficients in Natural Circulation Evaporators,* by L. C. Jenness and J. G. L. Caulfield.

2:00 P. M. ALKALINE PULPING
S. D. Wells, Chairman

1. *Suitability of High Density, High Summerwood Slash Pine for Kraft and High Grade Papers,* by S. L. Schwartz and M. W. Bray.
2. *Pulping Sweetgum by the Alkaline Processes: I. Effect of Cooking Variables on Yield and Quality,* by M. W. Bray and J. S. Martin.
3. *The Effect of Washing on the Strength of Bleached Sulphate Pulps,* by E. H. Smith, A. B. Moore, and K. G. Chesley.
4. *Chemical and Physical Characteristics of Soda Pulp,* by John Frankevicz and N. I. Bearse.
5. *Some Fundamental Factors to be Considered in Deinking Waste Papers,* by A. O. Bragg.

2:00 P. M. STUFF PREPARATION
W. D. Harrison, Chairman

1. *Disk Refiners in Paperboard Manufacture,* by W. H. Hall.
2. *Process Factors in Commercial Beating of Wood Pulps,* by H. R. Gaetz.
3. *Importance of Roll Pressures in Beating Pulp Stocks,* by C. D. DeMers and H. D. Johnston.
4. *Asplund Defibrating Process,* by Uno Lowgren.
5. *The Chemipulper,* by A. W. Nickerson.

2:00 P. M. INDUSTRIAL ENGINEERING AND FIBROUS RAW MATERIALS
L. T. Stevenson and John Traquair, Chairmen

1. *Storage and Product Preservation of Crop Fibers,* by H. R. Hay and E. C. Lathrop.
2. *Job Evaluation,* by R. H. Rositzke.
3. *Volume-Costs-Sales Relationships,* by B. R. Cancell.
4. *A New Index of Industrial Production,* by L. T. Stevenson.
5. *Patents and Preparedness,* by C. W. Rivise.

Program of Wednesday, February 19, 1941

9:30 A. M. GRAPHIC ARTS
M. S. Kantrowitz, Chairman

1. *Control of Paper Expansion in Multicolor Lithography,* by C. G. Weber.
2. *Inks and Their Relation to Paper,* by George Cramer.
3. *Hydry Printing Inks,* by D. R. Erickson and F. D. Elliott.
4. *U. S. Coast and Geodetic Survey Chart Making,* by D. P. Barnette.
5. *Moisture Content and Regain of Coated Papers,* by J. D. Davis.
6. *Tack Measurements for Printing Papers,* by A. E. Gessler. (by title).
7. *Specific Surface Measurement of Fine Particles,* by A. E. Gessler. (by title).

9:30 A. M. PULP PURIFICATION
J. D. Rue, Chairman

SYMPOSIUM ON CHLORINATION OF WOOD PULPS

1. *Some Aspects of the Chlorination of Sulphite Pulp,* by N. W. Coster and R. I. Thieme.
2. *Mechanism of Chlorination of Lignin,* by J. L. McCarthy and Harold Hibbert.
3. *Effect of Tannins on Alkaline Pulping,* by J. W. Bard.
4. *The Nature of Lignin Residues in Unbleached and Partially Bleached Sulphite Pulp,* by L. L. Larson.
5. *Solubility of Chlorine in Water,* by R. P. Whitney and J. E. Vivian. (by title).

PAPERS NOT IN THE SYMPOSIUM (by title).

1. *A Critical Review of the Literature of Pulp Bleaching,* by J. S. Tongren and J. L. Parsons.
2. *A Critical Review of the Literature of Pulp Purification for Dissolving Purposes,* by Fred Olsen.
3. Translation of F. Loeschbrandt's *The Bleaching of Sulphate Pulp,* by E. Martin.

9:30 A. M. STUFF PREPARATION
G. Lamont Bidwell, Jr., Chairman

1. *Production of Pulp from the Fibrous Elements of Sugar Cane Bagasse,* by S. D. Wells and J. E. Atchison.
2. *Pulping of Wheat Straw in the Rod Mill,* by S. D. Wells and P. Anthony Forni.
3. *Measuring and Recording Freeness Continuously,* by A. B. Green.
4. *Theory and Practice of the Dilts-Cowles Hydrapulper,* by E. M. Root and R. F. Vokes.
5. *Commercial Applications of the Sutherland Refiners,* by D. M. Sutherland.

2:00 P. M. FORMING AND FINISHING
A. E. Bachmann, Chairman

1. *Copes Consistency Control,* by Don Allshouse.
2. *Effect of Calendering Pressure on Sheet Properties,* by G. E. Mackin, E. L. Kelly, and P. K. Baird.
3. *Performance of the Streamflow Vat System on Ninepoint,* by J. R. Buchanan.
4. *The Mechanism of Softening Paper,* by C. M. Connor and A. H. Nadelmann.
5. *Continuous Coloring of Paper and Paperboard,* by F. A. Soderberg.
6. *Water Characteristics of the Wet End of the Paper Machine,* by P. M. Loddengaard.

2:00 P. M. COATING
F. W. Egan, Chairman

1. *Performance of Machine Coated Papers and the Scope of their Application,* by G. K. Dickerman.
2. *Measuring the Internal Bonding Strength of Paper,* by E. Sutermeister and H. W. Osgood, Jr.
3. *Opacity Variability as a Measure of Coated Raw Stock Performance,* by F. H. Frost.
4. *Requirements of Base Papers for Varnish Coatings,* by V. P. Ryan.
5. *Comparison of Water Ground Natural and Precipitated Calcium Carbonate for Paper Coating,* by A. R. Lukens, C. G. Landes and T. G. Ruchow.

2:00 P. M. CONTAINERS AND TESTING
J. D. Malcolmson and J. d'A. Clark, Chairmen

1. *Some Factors Affecting the Compressive Strength of Fiber Boxes,* by T. A. Carlson.
2. *Status of Stiffness Testing of Containers,* by Pierre Drewsen.
3. *Some Applications of Statistical Methods to the Interpretation of Routine Tests,* by T. A. Pascoe and Marian Fraser.
4. *Factors in the Quality Control of Thermoplastic Coated and Waxed Papers,* by T. W. Noble.
5. *A. T. & T. Business Papers Purchase Standards,* by W. H. Joy.

Program of Thursday, February 20, 1941

9:30 A. M. HEAT AND POWER
Roderick O'Donoghue, Chairman

1. *Blowdown Heat Recovery Systems for Sulphate Mills,* by G. A. K. Hunt and H. C. L. Miller.
2. *Interpretation of Flue-Gas Analysis,* by P. W. Swain.
3. *Controlled Conditioning of Paper,* by A. E. Montgomery.
4. *Lubricating Papermaking Machinery,* by T. E. Dial.

9:30 A. M. BACTERIAL CONTROL METHODS
Allen Abrams, Chairman

1. *Microbiological Problems Related to Water,* by A. E. Griffin.
2. *Economic Losses due to Microorganisms in Pulp Systems,* by J. R. Sanborn and Raphael A. Gillotte.
3. *Significance and Accuracy of Bacterial Counts from Paper and Paperboard,* by R. E. Breed and J. R. Sanborn.
4. *Bacteriological Technique for Studying the Decomposition of Felts,* by J. W. Appling, Olga A. Smith, and Douglas Fronmuller.

9:30 A. M. MECHANICAL PULPING
Lyman Beeman, Chairman

1. *Refining of Groundwood Tailings,* by C. P. Reaper.
2. *The Roberts Grinder,* by A. E. Bartlett.
3. *Drainage Resistance of Groundwood Pulp,* by W. O. Hisey and Kon Matchuk.

Annual Luncheon, Thursday, February 20, 1941

1:00 P. M.
W. H. Swanson, Chairman

ADDRESSES:

National Defense and the Paper Industry, by D. C. Everest, the Advisory Committee to the Council of National Defense.

G. N. Jeppson Heads Norton Co.

WORCESTER, Mass., January 27, 1941—George N. Jeppson was elected president of Norton Co. today, succeeding Aldus C. Higgins who resigned to become chairman of the board, a position vacant since the death last year of Charles L. Allen. Mr. Jeppson has been vice-president and treasurer. He went to work for Norton 49 years ago. Mr. Higgins entered its employ 40 years ago.

Mr. Jeppson entered the employ of Norton Company in 1892. After being assistant superintendent and works manager, he was chosen a director in 1906. In 1919 he was made secretary, and in 1933 became treasurer. He has been a vice-president several years.

Mr. Higgins became identified with Norton in 1900. He managed the abrasive plants before he was elected secretary in 1912, and treasurer and general counsel in 1919. He has been president since 1933.

The following were re-elected:

Harry K. Clark, vice-president and general manager; Andrew B. Holmstrom, vice-president in charge of production; Herbert A. Stanton, vice-president and foreign manager; Howard W. Dunbar, vice-president and manager of machine division; W. La-Coste Neilson, vice-president, and Lewis E. Saunders, vice-president.

Groveton Papers Co. Mills Busy

BOSTON, Mass., February 3, 1941—The Groveton Papers Company mills at Groveton, N. H., have been very busy and are now three weeks behind on delivery. At one time they were eight weeks behind. The company has been receiving orders for all of its products.

The Groveton Papers Company and the Wyoming Valley Paper Mills, Northumberland, N. H., are to have a suite of rooms at the Waldorf-Astoria, New York, at the time of the Convention.

Fraser Companies' Appointments

Announcement is made by Fraser Companies, Limited and subsidiary companies of the election of Aubrey Crabtree and L. M. Sherwood to the board of directors, and of the following changes in the senior officers of the company. Aubrey Crabtree becomes president to fill the vacancy created by the resignation of Col. K. S. Maclachlan, who is serving as Acting Deputy Minister of Naval Services. L. M. Sherwood becomes vice-president succeeding the late Donald Fraser.

The new president has over twenty-years' experience in the pulp and paper business. After returning from serving over-seas in 1919 he spent some time in study and then re-entered the business. From 1920 until 1928 he served in various capacities with Edwin Crabtree and Sons, at Sunapee, N. H., Adams Paper Company, Wells River, Vt., and Howard Smith Paper Mills Limited, at Crabtree Mills and Beauharnois, Quebec.

In 1928 Mr. Crabtree was made general superintendent of Canada Paper Company at Windsor Mills, Quebec, afterwards becoming resident manager. He joined Fraser Companies in the fall of 1930 as mill manager of Fraser Paper, Limited, and was appointed general manager of the company in 1935. He held that appointment until he became vice-president and general manager of Fraser Companies, Limited and subsidiary companies in February 1940, which offices he has held up to the time of his new appointment.

Mr. Sherwood's experience with Fraser Companies, Limited, covers a period of 25 years, with the exception of the time he served overseas in the last World War. On returning to Canada in 1919 he rejoined the Company as Chief Accountant.

His rise in the company has been progressively as follows: assistant treasurer in 1920, treasurer in 1929, vice-president in charge of finance in 1931, secretary in 1933, and vice-president and comptroller in February of 1940. With his new appointment as vice-president he still holds the offices of comptroller, secretary and treasurer of the parent company and subsidiaries.

Parker Corning Issues Statement

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., January 25, 1941—A statement was issued by Parker Corning, president of the Albany Felt Company, this week that he believes the concern should seek to maintain an open shop in order to respect the individual rights of workers. He asserted this was the remaining point in negotiations with the United Textile Workers Union, recently recognized as the bargaining agent for the employees. In his statement the mill official pointed out that all employees have had the benefit of free medical attention and for many years the company has carried a group insurance policy at no cost to the workers while over $65,000 in benefits have been paid. He also said that a cafeteria is operated at considerable loss entirely for the benefit of employees who can secure the best food at very low prices. He brought out that the only remaining point on which no agreement has been reached is the matter of whether or not the employees must join the union in order to hold their jobs. The concern has 520 employees, a great many of whom are not union members and many have been with the company for twenty years or more.

Preliminary Program for Convention of National Paper Trade Association

Waldorf-Astoria Hotel, February 17-20, 1941

The 38th annual convention of The National Paper Trade Association will be held at the Waldorf-Astoria, New York City, February 17-20. The convention will include the usual exhibit of wrapping papers, paper products, twines and kindred lines. Space has been reserved by 71 manufacturers and converters—the largest number ever participating in this feature of the Convention.

From the program it will be noted that two outstanding speakers will address the opening session Monday afternoon, February 17. Their topics will be of vital and timely interest to all members of the industry. This meeting will be open to manufacturers and guests whose attendance will undoubtedly tax the capacity of the hall. One speaker, Hon. Jos. E. Casey, Congressman from Massachusetts, is a man who has gained great recognition in Washington and who has an exceptional understanding of and sympathy with the needs and problems of business and industry. His interest is reflected by the fact that he recently addressed a meeting of the Council of National Wholesale Associations and also by his introduction in the last session of Congress of a bill to amend the Fair Labor Standards Act by exempting wholesale trades from the maximum hour provisions of the Law. Mr. Casey represents a district in Massachusetts in which the manufacture of papers is a highly important industry.

The other speaker is Dr. Theo. N. Beckman, Professor of Business Organization, Ohio State University, a man of national recognition and consultant to the Advisory Committee of the Council of National Defense.

The preliminary program is as follows:—

Sunday, February 16, 1941

2:00 P.M. Executive Committee Meeting — Pillement Suite.

Monday, February 17, 1941

10:00 A.M. Executive Committee (adjourned meeting)—Pillement Suite.

12:00 NOON Luncheon, Wrapping Division Merchandising Committee—Assembly Room N.

12:30 P.M. Luncheon, Executive Committee and Advisory Council—Pillement Suite.

2:30 P.M. Opening Session—Jade Room. Open to manufacturers and guests. Address: Hon. Jos. E. Casey, Congressman from Massachusetts. Address: Dr. Theo. N. Beckman, Professor of Business Organization, Ohio State University. Consultant to National Defense Commission.

Tuesday, February 18, 1941

Opening Meeting of Wrapping Division —East Foyer.

9:00 A.M. Wrapping Paper Committee, E. P. Magel, Chairman.

10:00 A.M. Bag Committee, Ed Wesselmann, Chairman.

11:00 A.M. Certification Board, F. T. Jamison, Chairman.

2:30 P.M. Tissue Committee, J. E. Roach, Chairman.

3:30 P.M. Gummed Tape Committee, C. H. Schorske, Chairman.

5:00 P.M. Wrapping Division Governing Committee Assembly—Rooms J K.

FINE PAPER DIVISION

10:00 A.M. Fine Paper Division Meeting — Jade Room. Survey Report of 1940 Operations.

5:00 P.M. Fine Paper Governing Committee—Assembly Room N.

8:30 P.M. Meeting of Board of Directors — N.P.T.A.—Assembly Room L M.

Wednesday, February 19, 1941

Wrapping Division Meeting—Jade Room

9:00 A.M. Twine Committee, C. A. Wilder, Chairman.

10:00 A.M. Divisional Meeting: Address on Sales Management and Salesmanship. Survey Report on 1940 Operations. Committee reports. Announcement of Sales Contest.

FINE PAPER DIVISION

2:00 P.M. Fine Paper Division Meeting — Jade Room. Commodity Meetings and discussion of Merchants' problems.

4:30 P.M. Conference of Local Secretaries and Executives with National Counsel—Assembly Rooms J K

Thursday, February 20, 1941

10:00 A.M. Annual Meeting, N.P.T.A.—Jade Room Reports of Executives. Reports of Board of Directors. Address of Counsel.

T. B. McCabe Made Director

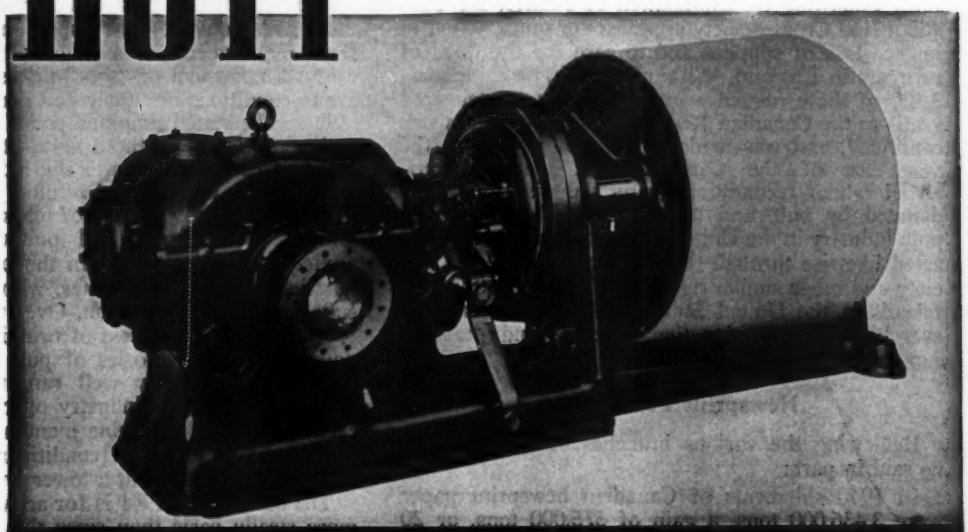
Thomas Bayard McCabe, president of the Scott Paper Company, of Chester, Pa., has been elected a director of Air Reduction Company, Inc.

Mr. McCabe also is a director of the Brunswick Pulp and Paper Company of Brunswick, Ga.; chairman of the board of the Federal Reserve Bank of Philadelphia and a member of the advisory commission of the Council of National Defense.

R. W. Bell to be General Manager

I. L. Gartland, president of the D. M. Bare Paper Company of Roaring Springs, Pa. announces the appointment of Roger W. Bell to vice president and general manager of the company.

BELOIT



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CANADIAN PULP AND PAPER ASSOCIATION MEETS

(Continued from page 7)

felts. Following the capitulation of France, the Canadian Red Cross Society appealed for quick action to replace loss of supplies and to care for the flood of refugees in England. Within a month, he said, some 3,500 of these rugged warm blankets were delivered gratis to the Canadian Red Cross Society. This work continued, and was made possible only through the assistance of the Canadian felt manufacturers, all of whom recondition gratis the discarded felts donated by pulp and paper mills. The paper and pulp industry in the United States had enthusiastically acted likewise through the American Red Cross Society and other similar agencies. "We would like our friends in the United States to know how grateful everybody here is for their interest and practical support," he added.

Newsprint Production

Reviewing the various branches of the industry, he said in part:

In 1940 shipments of Canadian newsprint paper were 3,436,000 tons, a gain of 575,000 tons, or 20 percent, over 1939. This high level of business in 1940 must be recognized as abnormal, arising from war conditions,—notably the elimination of some 700,000 tons of Scandinavian exports competitive with Canadian supply. Even at this high level, the idle effective capacity in Canada amounted to over 900,000 tons in 1940,—likely one million tons in 1941.

Although from these facts it is clear that newsprint problems are but abated during the continuance of present advantages, current conditions permitted newsprint to contribute a record credit to Canada's trade balance. Exports represent 95 percent of Canadian newsprint shipments. About 80 percent of these exports of newsprint went to United States. A substantial part of the balance also yielded United States funds.

Since invasion of Scandinavian pulp-producing countries, and later of pulp-consuming countries in Europe—notably France—the chemical pulp industry has faced many unpredictable problems and sudden calls. All have been met with an alacrity and unanimity of effort by all elements within the industry that is highly commendable.

Immediately after the onset of war the industry established such relations with the United Kingdom Controller of Paper, other British and Allied supply agencies, and the Canadian Ministry of Munitions and Supply that integrated every resource of the industry with their needs, all of which have been met completely and on schedule.

Although matters of price are entirely outside the province of this association, it seems only proper to observe that for such requirements the industry, by independent action of producers, established at the outset a policy—that the lowest price effective on continuing contracts in North America, representing by far the major part of the Industry's normal business—apply on shipments of standard grades to the United Kingdom and on demands from Government Agencies. The prices on special grades required would be related to these basic prices. It is to be noted that, irrespective of the "spot" nature of most of these requirements, this policy set aside entirely the upward movement of "spot" prices, sensitive as they are to conditions of supply and demand.

It can be stated that this policy was acceptable to and appreciated by these authorities, whose understanding co-operation with the industry has enabled it to produce the essential results.

The world-wide shifting of markets, veering uncertainties of sentiment and public opinion, caused anxiety and unsettlement in the pulp-consuming industries in the United States, with the inevitable result—inventory speculation. Over the last quarter of 1940 the salutary process of bringing more nearly to normal levels inventories of pulp and papers made therefrom has pretty well run its painful course. This branch of our Industry operated practically at capacity for the first nine months of the year. Due to the above-mentioned conditions, operations over the last quarter were at a lower level.

The outlook for 1941 is for activity continued on a more steady basis than since the onset of war, but possibly at not so high an average. Total exports of pulp amounted to about one million tons—an increase of about 52 percent over 1939.

Board

The steady growth of this branch of the Association is arresting. Here is a comparison of shipments: 1918—88,000 tons; 1929—250,000 tons; 1940—429,000 tons.

The pursuit of export business has been persistent. That it has been intelligently directed is evidenced by the fact that exports of board in 1940 exceeded those of ten years ago by 76 percent. Board has become a lusty contributor to Canada's foreign credits. 1940 also established a record for shipments to the domestic market.

Book and Writing and Miscellaneous Papers

This branch of the Industry is distinctive in that its main concern is supplying the Canadian market, although it has for many years pursued the development of continuing export trade, especially in countries comprised within the British Commonwealth.

Its well-being is constantly menaced by imports from countries enjoying a cost basis not attainable in Canada. This requires constant attention and co-operation with the Department of National Revenue so that a policy may be developed and maintained on a basis that does not invite reprisals, but promotes reciprocity.

Much research has been applied to making available papers of higher quality in wider variety. It is submitted that Canadian mills can supply practically all grades of "fine" papers needed by Canadian users.

War conditions thrust upon this branch of the industry heavy demands for "fine" papers from the United Kingdom, also from British Commonwealth and other countries which previously had relied on European sources of supply.

By ingenuity and cooperation these demands have,

to a large extent, been met,—and without failure to adequately furnish needs of Canadian users. Mills in this group have operated practically to capacity.

Hidden Resilience of Output

There is inherent in pulp and paper processes a "hidden resilience of output" well recognized within the Industry, but often overlooked by those not having a practical working knowledge of these processes. This "resilience" becomes effective under what might be termed "forced draft" operations, which so far have not been needed except for short periods during 1940 to meet temporary emergency needs. Apart from general "hidden resilience", there often develop specific hidden potentialities. An example of this is the situation of newsprint mills as to capacity for producing unbleached sulphite pulp. A result from more efficient processes in the manufacture of newsprint paper is a substantial excess of capacity for producing news grade unbleached sulphite pulp, one of the constituents of newsprint paper. The consumption of this grade of chemical pulp, except for the manufacture of newsprint paper, is strictly limited. Some manufacturers of newsprint paper have already taken steps to convert this pulp capacity to the production of prime strong unbleached sulphite pulp, of which there is a large and continuing consumption in North American and oversea markets. Stated conservatively, this "hidden resilience" amounts to several hundred thousand tons. Its availability can be accomplished in a fraction of the time, and requires but a fraction of the equipment.

In conclusion, he said: "Bigness of itself is neither valuable nor significant, but a few facts about this Industry will perhaps place it in proper perspective as part of the picture of Canada's national economy, and quicken our sense of responsibility. I shall not burden you with a maze of statistical data;—a few salient facts—stated in "round" figures—will suffice to indicate its present status.

"Total output of all kinds of paper and pulp during year 1940 amounted to about 9,500,000 tons, an increase of about 1,500,000 tons over 1939. In 1940 paper and pulp exports had an aggregate value of about 225 million dollars, an increase of about 75 million dollars over 1939.

"In 1913 paper and pulp exports constituted only 3 percent of Canada's total exports; in 1939 they were 17 percent of the total, and when complete figures for 1940 are available this percentage will probably be higher. Newsprint alone, with the single exception of gold, is Canada's most important single commodity in export value, and the export values of pulps and other pulp products are steadily climbing.

"The Industry is the largest single-industry employer in Canada. Including seasonal employment in woods operations, the number of workers at annual peak operations is about 120,000. The comparable figure for 1917 is about 50,000.

Canadian agriculture gains enormously through the purchasing power the pulp and paper industry provides in the wages it pays directly to these workers, and indirectly to workers in other industries supplying the Industry's needs. The Industry uses more electric power than any other single industry in Canada. Newsprint mills alone represent about 40 percent of total power consumption.

"The railways benefit by inward movement to the mills of many thousands of tons of wood, coal, sulphur, chemicals, machinery, and by outward movement of millions of tons of finished products to points throughout Canada and the United States, and to seaboard for export overseas. In the same manner, inland and ocean steamship lines benefit from the movement of the Industry's products and needs.

"Canada's mines supply copper, nickel, lead, iron, manganese, and other minerals in large quantities, comprised in pulp and paper mill equipment. Certain heavy manufacturing industries owe their inception and spectacular growth in Canada to supplying with machinery and equipment mills and factories making pulp, paper, and their derivatives.

"The heritage of this vast enterprise is a grave responsibility; an opportunity that calls for the best we all have to give. The prime opportunity lies today in placing this industry in a sound competitive position by improving its efficiency within, and through effective co-operation with and from other elements in Canada's national economy. We invite them to link arms with us."

Election of Officers

F. G. Robinson was re-elected president of the Association for the ensuing year.

The two sections have elected their officers for the ensuing year as follows:

Woodlands Section, chairman, L. A. Nix, Bathurst Power & Paper Co., Ltd., Bathrust, N.B.; vice-chairman, W. G. Wright, Price Brothers & Co., Quebec; councillors: F. Faure, Consolidated Paper Corporation, Ltd., Montreal; V. E. Johnson, Canadian International Paper Company, Montreal; R. G. MacFarlane, Fraser Companies Ltd., Edmundston, N.B.; E. B. McGraw, Ontario Paper Company, Ltd., Montreal; J. V. Perrin, Brown Corporation, Quebec; G. W. Phipps, Spruce Falls Power and Paper Company, Ltd., Kapuskasing, Ont.; H. G. Schanche, Abitibi Power and Paper Company, Ltd., Toronto; Secretary-Forester, A. M. Koroleff, Montreal.

Technical Section: chairman, W. B. Scott, Consolidated Paper Corporation Ltd., Grand'mere; Councillors, W. T. Bennett, Canadian International Paper Company, Gatineau; and W. A. Ketchen, Fraser Companies Ltd., Edmundston.

Impact of Conflict on the Industry

E. W. Tinker, executive secretary of the American Paper and Pulp Association, gave an address on the impact of the war on the pulp and paper industry of the United States. He said that as a result of the stoppage of imports of chemical pulp from Scandinavia in 1940, the additions to the United States pulp supply dropped from 1,600,000 tons in 1939 to 578,000 tons in 1940. Concerned over North American self-sufficiency in the future, the National Defence Advisory Commission, after exhaustive investigation, reached the conclusion that, providing anticipated importations from Canada could be obtained, and providing the paper industry operated at a normal rate, adequate supplies of chemical pulp would be available. At the same time it was indicated that all idle capacity would have to be maintained in production if this objective were to be achieved. Mr. Tinker emphasized that the United States would be dependent upon Canadian manufacturers for all the pulp that they can make available. He thought it unfortunate that during the past two or three months

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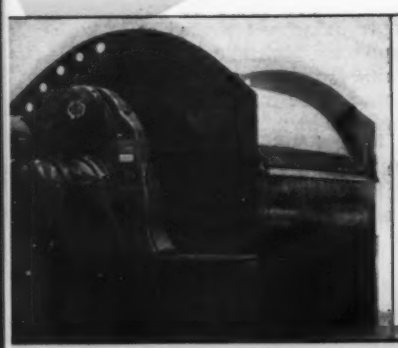
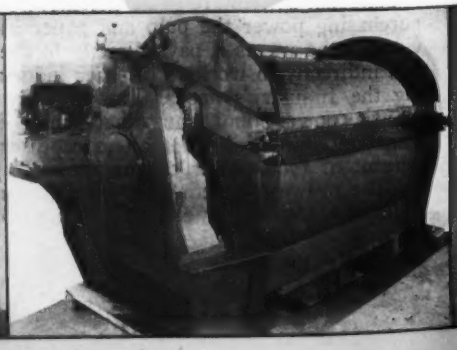


OLIVER
Ring Valve Black Liquor Washer
Note: Exterior view similar to that of Ring Valve Decker

OLIVER
Bleach Washer, Rubber-Protected



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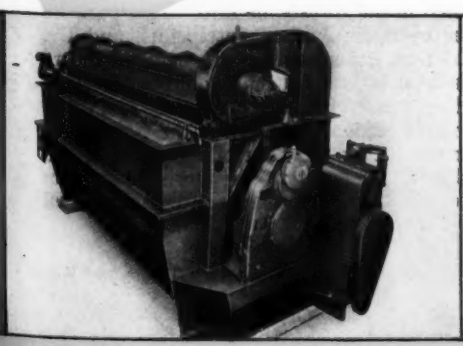
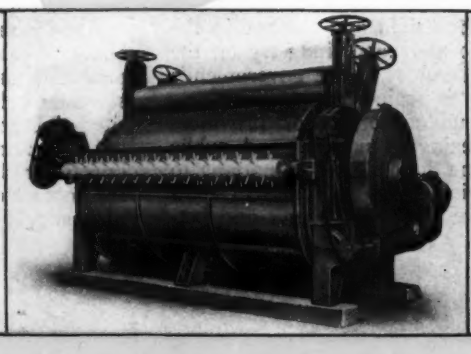
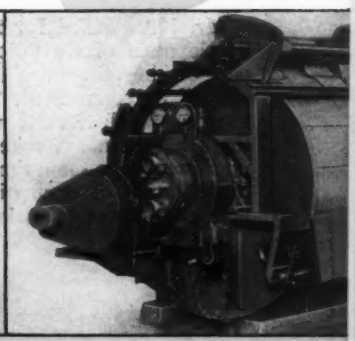


OLIVER
High Density Thickener



OLIVER
Lime Mud Filter



pulp mills had not been operating at their maximum capacity, due to the fact that converting mills and others purchasing pulp had been drawing upon available stocks on hand, for a sudden sharp turn in the operating ratio of paper mills would no doubt create a critical situation in a short time which would be difficult to overcome if stocks of pulp had gone down to too low a point. Indications were that if shortages occurred they would lie first in unbleached kraft and in unbleached sulphite pulp. "While it is true," he said, "that statistically the United States, if it receives the anticipated quantity of chemical pulp from Canadian manufacturers, can meet the situation, it will be by a very narrow margin, and the maintenance of this margin will be contingent upon a series of circumstances which may or may not be met."

As to the paper industry, a report by the same Government Commission indicated that there was sufficient capacity to meet almost any requirement for paper that might be made. In respect to pulpwood, if the United States were entirely self-contained from the point of view of supply, then, based on 1939 conditions, the enormous volume of seventeen and three quarter million cords would be required. Should no pulpwood from overseas become available, the near future domestic needs for pulpwood would more than double the needs of five or six years ago. It was true that up to the present time there had been no serious shortages of wood, but conditions that were developing emphasized the need of long-term planning to ensure the maintenance of an adequate accessible supply of pulpwood.

Predicting that Britain would win the war, he said that when international trade channels were again open, there would be a fierce economic struggle and the pulp and paper industry of the United States and Canada would be in a particularly vulnerable situation. He thought the situation would require real governmental consideration and action on the basis of a planwise program to give some protection to labor and employment, if not capital, and he urged the members of the association to look into the future and prepare themselves to exercise wise leadership in the post-war period.

Canada Can Increase Exports

That Canada stands in a favorable position to increase her exports of pulp and paper products, was the opinion expressed before the Technical Section by John S. Bates, of Price and Pierce Ltd., Montreal, who has had extensive experience in the pulp and paper trade overseas.

"One can at least feel reasonably confident," he said, "that Canada has a chance to share more fully in the 1,000,000 tons of unbleached sulphite normally imported by the United States and United Kingdom. Canada is well placed to export considerable tonnage of medium grade papers and boards in particular."

Mr. Bates called for foresight and courage in the development of the pulp and paper industry on the part of the companies involved. "The government's share," he commented, "is mainly to safeguard resources. With forests under control of provinces there has been a weakening of national and public interest. At the same time there should be nothing to prevent that determination which is found in competing countries to make the forest bigger and better over each succeeding decade. This is our vital problem."

Large Unused Reserves for Pulp

K. D. Running, of the Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec City, in a paper on "Hardwood Utilization by the Paper Industry," said there are large reserves of wood on this continent, which are not now commonly used for the making of pulp and paper but which could be utilized. Investigation, he stated, had been made of the possibility of using hardwoods and other species of woods little used by the industry. The greatest supply of these woods are in the species of jack pine, birch, maple and aspen. It is estimated that there are nearly 165,000,000 cords of birch available in Canada and 45,000,000 cords of maple. The higher density of these woods, however, makes river delivery difficult due to log sinkage.

Aspen, of which there are many millions of cords available, floats as easily as the regular conifers, he pointed out. Its use, when mixed with other woods, presents no special difficulties. The same holds true of jack pine if it is not used in quantities in excess of 10 to 15 percent.

S. C. Whipple and M. W. Price, of the Gatineau division, Canadian International Paper Co., discussed ways and means of reducing wood waste in the various stages from woods operation to chipping in the mill. "The study of wood waste presents," they pointed out, "a field in which considerable savings can be affected. While small losses may seem of no great importance when seen from day to day, when one considers what a decrease of even one percent in loss on the total wood used means in dollars and cents at the end of the year, it can then be more fully realized the savings are of such magnitude as to warrant considerable study on the part of all mill operators."

One of the means taken to utilize waste wood products, which in the past have been allowed to contaminate rivers, was described by E. J. Calman and J. W. Franklin, of the Quebec North Shore Paper Co., Baie Comeau, Que., who presented a paper on "Bark and Refuse Fuel Burning." They described the equipment used in different mills to burn the wet bark and waste wood. Equipment has been devised for handling these products. "A good pile of bark, stored not too far from the mill, may be worth," the authors of the paper pointed out, "about one-third its day weight in bituminous coal."

Damage by Sawfly Discussed

Dr. J. J. DeGryse, chief of the Division of Insects of the Entomological Branch of the Dominion Department of Agriculture, told of the work the government had been doing to combat the spruce sawfly which had caused widespread destruction in the forests of the Maritime and Central Provinces. Millions of parasites of the sawfly imported from Europe had been distributed in the forests, he said. This parasite has the name of microplectron fuscipenus, and Dr. DeGryse said that experiments were being made to produce a superior breed of it that would better withstand the colder weather of northern areas. The parasite had been established fairly well in the Gaspe area but was not producing the controlling effect it did in warmer climes. The present was a critical stage in the control of the sawfly pest and efforts at control of it should not slacken.

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Incidentally he remarked that Nature is coming to the aid of man in this matter, for there was spreading through the New England States a virus disease that was destroying the larvae of the sawfly in great quantities. He believed this disease, which was an important addition to the biological forces arrayed against the destructive pest, would play an important part in spruce conservation in future.

What the disease was, had not been definitely established, but virus taken from dead sawflies and spread on living organisms had killed them, so that there was a possibility of spreading it artifically in other areas, and thus reducing sawfly production very considerably. "This may be a turning point in the whole situation," said Dr. DeGryse, "but as diseases are sporadic in their field and virulence, it is not wise to count on them too much and meanwhile the distribution of the parasite that attacked the sawfly is being continued with the cooperation of the operators in the forests."

Fungi Worse Than Insects

Dr. A. W. McCallum, of the Experimental Farms, Ottawa, gave a review of forest pathology, in which he stated that fungi was more insidious and destructive than insects, who were kept down by natural enemies. Some progress had been made in combatting this, but facilities for an increased amount of research work were urgently needed, as also larger trained personnel.

G. Wilson, on behalf of the operators, said forest pathology had been too long neglected, and an effort would be made to secure from the association grants to set up proper facilities for research work, and funds to train men to assist those already in the field.

Dr. J. M. Swaine, director of science service, Ottawa, said this was the most important matter from the standpoint of the operators, for there were too few pathologists and inadequate facilities for research. If the association could provide funds, the Government would provide the facilities, and valuable work would be accomplished to save Canadian forests.

The chairman, A. L. Nix, Bathurst, N.B., said the amount of waste and destruction by disease was as great as by insects and fire combined, and to combat this the full co-operation of the industry was required.

The Appleton Institute

Westbrook Steele, Executive Director of the Institute of Paper Chemistry, Appleton, Wis., gave a most interesting address on "Education and Industry, a Productive Partnership." He outlined at length the establishment and work of the Institute at Appleton, the program of which he said was three-fold:

1. Education of man power specifically for the paper industry at the graduate level;

2. The establishment of a library with the ultimate aim of gathering all the available scientific literature pertaining to pulp and paper, its chemistry and processes;

3. The prosecution of scientific research in the fundamental problems of the pulp and paper industry.

The Institute was a nonprofit organization and apart from original endowments was entirely supported by the paper industry and its allies, its membership representing 170 paper and pulp mills, manufacturing 50 per cent of the total U. S. production of pulp, newsprint, paper and board.

Fifteen carefully selected students were admitted each fall, selected from some 200 candidates for a four-year course. Much research work was done, and all patents and patentable ideas developed and originating with the Institute belong to the Institute and through it to its membership or in certain circumstances to a company or group originating and financing the project.

The Institute had demonstrated the effectiveness of partnership between education and industry, since it was proving an economical means to develop trained man power and to discover fundamental facts.

Associations to Coordinate Activities

The Newsprint Association of Canada and the Canadian Pulp and Paper Association, which together represent some 95 per cent of the production of pulp and paper in Canada, have taken an important step toward co-ordination of their activities in the formation of a joint board of their executive committees.

While the two Associations have always collaborated on matters of mutual interest, and many companies participate in both, wartime conditions have emphasized the necessity for closer co-ordination of all elements comprised in the industry as a whole. The joint board of the two Associations has been established as a means to this end. It is composed of three representatives of each association, including the two association presidents, who act as joint chairmen. It will function as a connecting link between the two associations under direction of the respective executive committees.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 5, 1941—Government Printing Office has received the following bids for 67,000 sheets of 24 x 38 white vellum tracing paper; Charles W. Speidel & Company, $34.00 and $35.00 less 1%; J. H. Weil & Co., $29.50 and $39.10; Eugene Dietzgen & Co., $53.50; Keuffel & Esser Company, $86.00; Charles Bruning Company, Inc., $75.10 and $56.66; Midern Blueprint Company, $52.00; and Mathers-Lamm Paper Company, $46.85.

For 150,000 sheets of 10¼ x 16 white duplicating paper; Ditto, Inc. , $2.20 per M sheets; R. P. Andrews Paper Company, $2.04; Whitaker Paper Company, $1.30 and Barton, Duer & Koch Paper Company, $1.25, $1.50, $1.40, and $1.70.

For 10,700 pounds (107,000 sheets) of 75% rag, 20½ x 29, laid antique book paper; R. P. Andrews Paper Company, 10.2 cents; and Barton, Duer & Koch Paper Company, 10.49 cents.

For 8,260 pounds (100,000 sheets) of 100% rag, 17¾ x 36 white recording chart paper; Paper Corporation of U. S., 29.5 cents; Mudge Paper Company, 24.86 cents; and R. P. Andrews Paper Company, 34.5 cents.

For 120,000 pounds of 25% rag, bond paper in 32 inch rolls; Aetna Paper Company, 9.24 cents; R. P. Andrews Paper Company, 9.67 cents; Barton, Duer & Koch Paper Company, 9.47 cents; Stanford Paper Company, 10.24 cents; Virginia Paper Company, 10.25 cents; Graham Paper Company, 10.24 cents; Paper Corp. of U. S., 10.25 cents; and Mudge Paper Company, 10.09 cents.

CONSTRUCTION NEWS

Oshkosh, Wis.—The Oshkosh Corrugated Box Manufacturing Company, Harrison and Murdock streets, manufacturer of corrugated boxes and containers, has approved plans for new addition to plant, to be one-story, reported to cost about $50,000, including equipment, General contract for erection has been awarded to Fluor Brothers Construction Company, 48 Otter street, and work is scheduled to be placed under way at once.

Cincinnati, Ohio—The Paper Service Company, Station avenue, general paper goods, has completed plans for new paper-converting, storage and distributing plant on Carthage avenue, Arlington Heights, in vicinity of present building. It will be two-story, 60 x 100 feet, reported to cost over $60,000, with equipment. Bids have been asked on general erection contract and award is scheduled to be made at early date. Grunkemeyer & Sullivan, 3717 Eastern avenue, Cincinnati, are architects.

Omaha, Neb.—The Carpenter Paper Company, 401 South Ninth street, commercial paper products, has awarded contract to the Peter Kiewit Sons Company, Omaha National Bank Building, for remodeling and improving second floor of building now occupied, location noted, to provide increased operating facilities. No estimate of cost announced. Work will proceed at once. John Latenser & Sons, Inc., 1307 Farnam street, Omaha, is architect.

Los Angeles, Calif.—The United States Envelope Company, Springfield, Mass., manufacturer of commercial and other envelopes, paper cups and other paper specialties, has begun superstructure for new branch plant at 2828 East Twelfth street, Los Angeles, recently referred to in these columns, and will arrange for equipment installation at early date. It will be one-story, about 115 x 190 feet, and is reported to cost in excess of $80,000, with equipment. New plant will be operated as the Los Angeles Division of company. The Austin Company, 777 West Washington boulevard, Los Angeles, has the general contract for construction.

Springhill, La.—The Southern Kraft Corporation, 220 East 42nd street, New York, N. Y., a subsidiary of International Paper Company, same address, has acquired a tract of about 10,000 acres of timber property in Bossier Parish, La., and will develop for pulp wood supply for mill at Springhill, used for production of kraft paper and board specialties. It is understood that part of tract will be placed in service at early date, with installation of sawmills and other production facilities.

Hyde Park, Mass.—Loomis & Co., Inc., 1560 River street, manufacturer of paper specialties, sustained a fire loss at mill on January 29, when portion of structure was damaged. Loss is reported at close to $12,000. The damage will be replaced at once.

Westfield, Mass.—The Stevens Paper Mills, Inc., Windsor, Conn., manufacturer of special tissue papers, insulating paper stocks, etc., has awarded general contract to R. F. Jones Company, 15 Lewis street, Hartford, Conn., for proposed addition to mill at Westfield, recently referred to in these columns. It will be two-story, instead of one-story as previously noted, about 50 x 110 feet, and is reported to cost over $65,000, with equipment. Work is scheduled to begin at once.

Holyoke, Mass. — The National Blank Book Company, Water and Appleton streets, manufacturer of commercial paper products, has completed plans for new addition to plant, to be three-story, about 25 x 25 feet. A building permit has been issued and work will be placed under way at once by day labor under company supervision. New structure will be used for increase in manufacturing department. Cost is reported close to $20,000, with equipment.

Kansas City, Mo.—The Graham Paper Company, 332 West Sixth street, commercial paper products, has superstructure in progress on new one-story building at 14th and Clay streets, North Kansas City, recently referred to in these columns, and expects to have structure ready for occupancy at early date. It will total about 40,000 square feet of space, and has been secured under long-term lease from the North Kansas City Development Company, Railway Exchange Building, owner. Cost is estimated close to $65,000, with equipment. The Hiram Elliott Construction Company, 912 Baltimore avenue, Kansas City, has the general erection contract.

Port St. Joe, Fla.—The St. Joe Paper Company, manufacturer of kraft liner papers, corrugating board, etc., is reported to be planning erection of additional buildings at local mill, comprising one or more one-story structures for increased operations.

New Companies

Los Angeles, Cal.—The Hollywood Paper Box Corporation has been incorporated with capital of $10,000, to manufacture and deal in paper boxes and containers of various kinds. The incorporators include Charles L. Wild and P. F. Breen, both of Los Angeles; and L. M. Simpson, West Los Angeles. New company is represented by McCutchen, Olney, Mannon & Greene, Roosevelt Building, Los Angeles, attorneys.

Yonkers, N. Y.—The M. Engle Paper Corporation has been organized with capital of 100 shares of stock, no par value, to deal in paper goods of various kinds. New company is represented by Philip Gelfand, 270 Broadway, New Nork, N. Y., attorney.

Brooklyn, N. Y. — The Marantz-Davis Paper Corporation has been chartered with capital of 100 shares of stock, no par value, to deal in paper products for commercial and other service. New company is represented by Frankel & Rothstein, 2 Lafayette street, New York, N. Y., attorneys.

Toledo, Ohio—Paper Packages, Inc., has been incorporated with capital of 250 shares of stock, no par value, to manufacture and deal in paper boxes and containers, and allied paper goods. The incorporators are Ladow Johnston, and Harry S. Bugbee, Second National Bank Building, Toledo. Last noted is company representative.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending February 5, 1941

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	31¾	29⅞	30½
Celotex Corp.	8¾	8⅜	8½
Celotex Corp., pf.	70	67½	70
Certain-Teed Products Corp.	4⅜	4⅛	4⅛
Certain-Teed Products Corp., pf.	33⅛	30½	32¼
Champion Paper & Fibre Co.	19¼	18½	18¾
Champion Paper & Fibre Co., pf.	105	105	105
Congoleum-Nairn Co.	17⅝	16¾	17⅝
Container Corp. of America	15	14½	14½
Continental-Diamond Fibre Co.	7⅞	6⅝	7⅞
Crown-Zellerbach Co.	14⅜	13⅝	13⅞
Crown-Zellerbach Co., pf.	91	89⅞	90
Flintkote Co.	13¾	12⅞	13¾
Robert Gair	2	1⅞	2
Robert Gair, pf.	16½	15¾	15⅞
International Paper & Power	13⅛	12¼	13⅛
International Paper & Power, pf.	63	60½	62¾
Johns-Manville Corp.	57½	56	57½
Johns-Manville Corp., pf.	....	....	....
Kimberly Clark Corp.	36¼	36¼	36¼
MacAndrews & Forbes	30⅝	30	30
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	27¾	25¾	25¾
Mead Corp.	8⅝	8	8¼
Mead Corp., pf.	70	70	70
Paraffine Companies, Inc.	32	32	32
Paraffine Companies, Inc., pf.	105	104¼	104¼
Rayonier, Inc.	14¼	13½	14¼
Rayonier, Inc., pf.	28⅜	27⅜	27¾
Ruberoid Co.	15½	15½	15½
Scott Paper Co.	35	34	34
Scott Paper Co., pf.	115	114	115
Sutherland Paper Co.	21¼	21	21¼
Union Bag & Paper Corp.	11¼	10⅜	11
United Paperboard Co.	3⅛	3	3
U. S. Gypsum Co.	63¾	62¼	63¾
U. S. Gypsum Co., pf.	179½	177	179

New York Curb Exchange

High, Low and Last for Week Ending February 5, 1941

	High	Low	Last
American Box Board Co.	4½	4½	4½
Brown Co., pf.	15½	15¼	15¼
Great Northern Paper	41	39½	39½
Hummel-Ross Fibre Corp.	5¾	5½	5⅝
National Container Corp.	12	12	12
St. Regis Paper Co.	2¼	2⅛	2⅛
St. Regis Paper Co., pf.	79¼	74½	74½
Taggart Corp.	3¼	3	3

Abitibi Reports Good Year

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 3, 1941—While the public awaits the recommendations of the Royal Commission inquiring into the affairs of Abitibi Power and Paper Company, it is interesting to note how the company has been doing under the efficient management of the receiver, G. T. Clarkson, during recent months.

Interim monthly reports indicate that the receiver has brought the company to a position where it has $7.8 millions available for payment of depreciation and bond interest from 1940 operations. This compares with $3.5 millions on the same basis for 1939.

Looking at these figures with the most conservative eyes and putting extreme caution into their interpretation, these figures suggest that Abitibi earned its bond interest, plus "interest on unpaid interest," slightly less than twice over during the past twelve months, and this after depreciation. This conclusion is reached by basing interest requirements on Mr. Clarkson's figures as $3.1 millions and depreciation requirements at $1.8 millions.

Looking at the showing from the standpoint of a straight 5 per cent interest on the outstanding $48.3 millions of bonds, the company would have earned this requirement 2½ times, after depreciation.

December earnings, although 41.26 per cent over the figures for the closing month of 1939, were below the November, 1940, figures by approximately $100,000, which is in keeping with the steady decline since last July. Earnings for 1940, of course, include $1.5 millions in premium on United States exchange.

The receiver estimates that the newsprint shipments for January this year will run about 25,700 tons. Last January the figures were 25,800 tons and in December, 1940, they were 36,568 tons, so that it appears likely that earnings for the month just past will be a little less than they were in the closing month of the old year as well as being below the first month of last year.

The company's 1940 newsprint shipments indicate that operations were on a greater scale than in any year except 1929 and 1937. Although news shipments in 1937 were higher than in the year just past, net earnings during the latter year were well above the $4.7 millions of 1937.

Shipments of bleached sulphite pulp last year set an all-time record by a substantial margin as far as Abitibi figures are concerned. The 1940 total of 73,971 tons compares with the previous record of 1937 of 58,392 tons. However, the receiver estimates that January shipments of pulp will amount to 5,300 tons, which is substantially below the December figures of 6,014 tons as well as being below the figures for January, 1940, which are 5,415 tons.

Total shipments for the last three years are as follows: Newsprint, 1938, 291,480 short tons; 1939, 323,889 tons; 1940, 430,489 tons. Bleached sulphite pulp, 1938, 33,363 short tons; 1939, 45,819 tons; 1940, 73,971 tons.

Paraffine Earns $282,077

Paraffine Companies, Inc., and subsidiaries for the December quarter, reports a net profit of $282,077, equal, after dividend requirements on 4 per cent cumulative convertible preferred stock, to 54 cents each on 476,062 shares of common stock, against September quarter net profit of $391,448, or 77 cents a common share, and $473,655, or 95 cents a common share, for December quarter of 1939. Six months to December 31: Net profit, $673,525, or $1.31 a share on common, against $955,627, or $1.91 a common share, for the six months to December 31, 1939.

Consolidated Earnings Higher

The Consolidated Paper Company for the year ended December 31, 1940, reports a net income $1,587,812 after all taxes and charges, equal after preferred dividends to $1.69 a share on the common stock, compared with $933,043, equal to $1.24 a share in preceding year.

Crystal Nets $1.45

The Crystal Tissue Company for 1940 reports a net income of $154,639, equal to $1.45 each on 93,000 shares of common stock, compared with $118,433, or $1.06 a share in 1939.

Indianapolis Stronger

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., February 3, 1941—Ideal winter weather during the last week seemed to stimulate the paper market in this section. Most lines were moving in better shape than they have since the first of the year and it may be that the first quarter will show up favorably. Best of all there seems to be a strong undercurrent to the market ranging from fine papers down to rags and waste paper.

The fine paper demand is increasing slowly with all grades receiving their percentage of business. Prices continue firm.

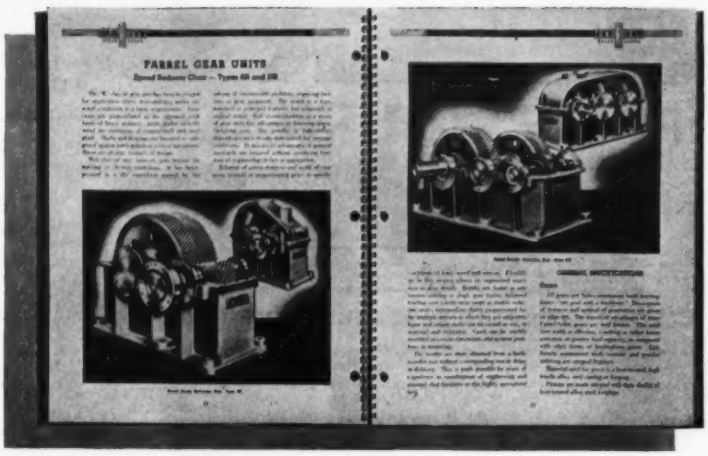
Demand for building paper and roofing is good in spite of the season and is much better than it was this time a year ago. Dealers are buying in small quantities to prevent their stocks from becoming unbalanced and by the end of this month should be in the market in a big way, for all indications point to a biulding year in prospect better than the one just past.

All lines of groundwoods appeared to be doing nicely. Kraft is increasing rapidly in demand. Inquiries are being received in considerably larger volume for sulphites and trade is resulting.

Newsprint also is increasing in demand as advertising lineage gains. Most of the increase seems to come from the papers in the smaller industrial centers, local lineage not having shown the same rate of increase.

Quite a change for the better has been seen in the box situation since the middle of last month. Following inventory, the Indiana factories began on orders that had accumulated during inventory period and most of them have been operating steadily since that time. Much of the present business is due to defense work on the part of Indiana factories but the entire demand base appears to be broadening.

Trading in rags of the better quality showed a fair increase last week with the prospect of more to come. Quotations were about the same. Roofing rags were active. About the same is true of the waste paper market with better grades being most in demand and fairly active.



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The Gear with a Backbone

John Dorr Receives Perkin Medal

The Perkin Medal, highest award in the chemical profession, was awarded to Dr. John Van Nostrand Dorr, president of the Dorr Company, Inc., New York, by the unanimous vote of a committee representing the five chemistry and chemical engineering societies, at the Chemists' Club, New York, Friday evening, January 10. This award, established in 1906 in honor of the late Sir William H. Perkin, is awarded annually for outstanding achievement in the application of chemistry to industry.

Dr. Dorr's address "The Engineer and His Responsibilities to the World of Today and Tomorrow" was on a far broader plane than mere engineering and technical endeavor and in this respect was probably unique in the annals of Perkin Medal acceptance speeches. It took the form of a broad and far-seeing philosophical discussion of the role of the engineer—his responsibility to his profession, his country and the cause of humanity throughout this complex and sorely troubled world of ours. Human engineering was its central theme and the hope was advanced that engineers who have been so successful in utilizing our material resources for human good, would utilize the same engineering approach to solve the broader problems of civilization and world politics.

PAPER
TRADE JOURNAL
This Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 112 February 6, 1941 No. 6

COMING EVENTS IN PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Sixty-fourth Annual Convention and meeting, Waldorf-Astoria Hotel, New York, February 17-21.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Roosevelt Hotel, New York, February 17-20.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 18.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel, New York, February 17-20.

THE NEW YORK ASSOCIATION OF DEALERS IN PAPER MILLS' SUPPLIES, Annual Banquet, Commodore Hotel, New York, Tuesday, February 18.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Twenty-second Annual Convention, Poland Spring House, Poland Spring, Me., June 17-19.

INDUSTRY ON UPTREND

In considering the state of industry thus early in the year, the prospect is for high productivity in goods and materials most essential to national defense and a much more moderate gain in many lines of the most widely used consumer goods. The economic position of the United States, as well as conditions overseas, have changed and changes must be expected to occur in the future. The transition of this country from a peace-time economy to one of military preparedness has, of course, merely started but already many changes are apparent and more radical shifts must be made to complete the national defense program viewed as essential to provide national security.

As important departures from former economic policies must inevitably set up various stresses and strains, so the state of business in the future can scarcely be expected to function in the manner associated with a world at peace. Some of the dislocations and economic strains which European countries are undergoing are felt throughout the world and the probability is that the tension thus exerted on business must continue for an indefinite period. The United States is by its possession of total resources, the most fortunate country in the world, but as the greatest defensive undertaking in our history is now in progress, sacrifices proportionate to its fulfillment must be made. A period of inflation and intense general business, in the opinion of competent authority, lies ahead.

The outlook in general is, therefore, definitely encouraging, despite the frequent emphasis in defense, debt and inflation obstacles. Economic conditions in the United States for an undetermined period are likely to be similar, in certain aspects, to those of a belligerent country, states the Guaranty Trust Company of New York in the current issue of *The Guaranty Survey*, published on January 27. "The conflict and the national defense program have brought a prospect of far-reaching changes in the economic position of the United States and have presented the much-discussed question of inflation in a new aspect," *The Survey* continues. "In his budget message the President estimates that the national debt will increase by $15,400,000,000 during the current and the next fiscal year. The authorities of the Federal Reserve system have publicly stated that their existing powers are not sufficient to enable them to discharge all their responsibilities under present conditions and have recommended to Congress a number of legislative measures 'to forestall the development of inflationary tendencies'."

In further commenting on probable methods of government financing, the article states in part that, "There will be a large and urgent demand on the part of the Government for a long list of defense materials, and a great part of the cost will undoubtedly be met, not from tax receipts nor from individual savings, but from new purchasing power created by credit expansion. This is the typical method of war finance, the method that has commonly led to price increases in nations carrying on major conflicts. To what extent the current program will tend to produce such consequences, and to what extent these results can and should be avoided by appropriate counter measures, are among the most difficult and the most vitally important questions arising out of the present situation."

New influences on prices are seen and *The Survey* points out that, "A large share of the defense costs will probably be met by the sale of Government obligations to the banks; and the funds thus borrowed, as fast as they are spent by the Government, will go to swell the already large volume of bank deposits. This means that the purchasing power required by the Government, instead of being taken from the citizens in the form of taxes or of borrowed savings, will be created anew and thus will be added to the purchasing power already in the hands of private individuals and organizations. In this way the Government will be placed in the position of bidding against its own citizens and against foreign buyers for the supply of goods and services that it needs. Unless this duplication of purchasing power can be counterbalanced by an equivalent increase in output, or unless the private and foreign purchasing power can

be partially sterilized by other means, the natural result would appear to be a rise in prices sufficient to freeze out a portion of the private demand and to bring total demand into equilibrium with total supply. . . . If industry and labor exercise the necessary degree of voluntary restraint, and if the broad powers at the disposal of the Government are used with sufficient promptness and decision, it should be possible to prevent, or at least to limit, the development of the vicious price and wage spiral that is the usual accompaniment of military emergencies."

Moderate expansion of output is the prospect in the paper industry for this year, in the opinion of competent authority. Although general industrial activity may rise as much as 15 per cent higher this year than last year, the volume of consumer sales of paper and paper products is not thought likely to increase more than 5 or 6 per cent over that of last year. In discussing paper prices it has been pointed out that many grades are now quoted below cost based on the replacement price of pulp; that prices in general are below the prevailing level in 1937, although costs of raw materials, labor, and taxes are higher, therefore paper manufacturers should have higher prices for their products to compensate for increasing costs. No critical shortage of pulp is looked for, although certain grades of wood pulp are likely to become scarce. United States and Canadian manufacturers are expected to increase production this year but the bottleneck created by the shortage of unbleached sulphite may be difficult to remove. Steadily increasing consumption of paper is the keynote of rising production in the paper industry. The per capita consumption of all grades of paper and paper products increased to 253 pounds in 1940, from 242 pounds in 1939, the larger figures indicating an increase of nearly 15 per cent over the per capita consumption in 1929, when production totaled 11,140,235 tons, compared with the all-time high record estimated for 1940 of over 14,300,000 tons.

Chlorine Institute Meets

The Chlorine Institute, Inc., held its annual meeting and directors' meeting January 22 at the Chemists' Club, New York, N. Y. The following directors were elected for two years: N. E. Bartlett, Pennsylvania Salt Manufacturing Company; Thomas Coyle, R. & H. Chemical Department, E. I. duPont deNemours & Co., Inc.; John A. Kienle, The Mathieson Alkali Works, Inc.; Louis Neuberg, Westvaco Chlorine Products Corporation; Eli Winkler, Columbia Chemical Division, Pittsburgh Plate Glass Company.

The hold-over directors are: R. W. Hooker, Hooker Electrochemical Company; S. W. Jacobs, Niagara Alkali Company; E. C. Speiden, Isco Chemical Division of Innis, Speiden & Co.

At a directors' meeting following the annual meeting, the officers shown below were elected for the year 1941: S. W. Jacobs, president, E. C. Speiden, vice president, Robert T. Baldwin, secretary and treasurer.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months 1941	1940	1939	1938	1937	1936	1935	1934
Jan.	90.2%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
Feb.	86.2%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
Mar.	83.9%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
Apr.	86.3%	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	91.8%	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	93.8%	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	87.1%	75.2%	72.0%	81.8%	77.3%	64.9%	.....
Aug.	87.2%	82.9%	77.2%	82.9%	81.5%	70.9%	.....
Sept.	83.2%	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
Oct.	88.0%	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
Nov.	86.9%	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
Dec.	83.3%	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Avg.	87.5%	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 4 weeks 86.8%	90.5%	77.5%	63.9%	90.3%	76.1%	65.2%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS		CORRESPONDING WEEKS	
December 21, 1940.....	91.1%	December 23, 1939.....	93.9%
December 28, 1940 (Holiday Week).....	64.3%	December 30, 1939.....	76.2%
January 4, 1941.....	82.2%	January 6, 1940.....	88.0%
January 11, 1941.....	88.6%	January 13, 1940.....	92.7%
January 18, 1941.....	89.3%	January 20, 1940.....	90.1%
*January 25, 1941.....	87.9%	January 27, 1940.....	91.2%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Dec. 21, 1940	Dec. 28, 1940	Jan. 4, 1941	Jan. 11, 1941	Jan. 18, 1941	Jan. 25, 1941
0% to 50%.....	45	108	80	49	41	35
51% to 100%.....	247	181	212	236	219	206
Total Mills Reporting..	292	289	292	285	260	241

Paperboard Operating Ratios

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	70%	76%	79%	72%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	74%	72%	79%	77%	71%	73%

Week end. Dec. 21, 1940—80%
Week end. Dec. 28, 1940—48%
Week end. Jan. 4, 1941—59%
Week end. Jan. 11, 1941—77%
Week end. Jan. 18, 1941—78%
Week end. Jan. 25, 1941—78%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

* Preliminary figure.

Good Outlook for Newsprint

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 5, 1941—The current outlook in Canada's important newsprint industry is decidedly optimistic, according to the Forest Products Division, Department of Commerce. Production and shipments increased throughout the course of 1940 and regardless of this development North America paper stocks showed little overall change. Reports indicate that Canadian newsprint production is keeping well in line with the demand, there being only slight fluctuations from month to month. Producers this year pride themselves that they have been able to gauge and anticipate shipments.

It is estimated that the gross earnings of Canadian newsprint companies in 1940 will be well over those of 1937, which previously had been the peak year since the beginning of the depression in 1930.

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IT WILL PAY YOU TO INVESTIGATE THE ECONOMIES OF **INGACLAD** STAINLESS-CLAD STEEL

"A Borg-Warner Product"

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

United States Patents on Papermaking

Fourth Quarter, 1940

Compiled by Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

The following list of United States patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Since, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; it is also possible that some patents have been included which do not apply to papermaking.

Copies of any of the following patents may be obtained from the U. S. Patent Office, Washington, D. C., by sending ten cents for each patent desired. The number, name of the inventor and title of the patent should be given in the request. Personal checks and postage stamps are not accepted. Books of coupons may be purchased for $2.00 or $10.00, good for 20 or 100 patents. Coupon orders do not have to be accompanied by letters of transmittal.

October 1, 1940

2,216,137. Diazotype photographic printing paper. Maximilian Paul Schmidt and Oskar Süs, assignors to Kalle & Co. Aktiengesellschaft, Wiesbaden-Biebrich, Germany. Filed Oct. 10, 1936. 4 claims. (Cl. 95-6). A light-sensitive material which comprises a diazo compound and developing means which comprises a coupling component and a neutral reacting salt of a weak base with a weak acid, the material being free from dust.

2,216,143. Process of coating paper. William F. Thiele and Howard Brewster Richmond, assignors of nine-tenths to Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis., and one-tenth to Peter J. Massey, River Forest, Ill. Filed May 11, 1936. 4 claims. (Cl. 92-40). A method of producing on a Yankee type papermaking machine relatively thin paper which is coated to render the paper substantially opaque.

2,216,179. Preparation of pregelatinized starches. Hans F. Bauer, assignor to Stein, Hall Manufacturing Company, Chicago, Ill. Filed Jan. 15, 1937. 8 claims. (Cl. 127-32). The process comprises adding to a normally air-dried starchy polysaccharide about 15 to about 60 per cent moisture and steaming the pre-moistened materially at substantially atmospheric temperature until partial bursting of the starch occurs and subsequently drying and grinding simultaneously the product while still in a moist state.

2,216,180. Coating composition. Frank M. Beegle and Harry L. Andrews, Jr., assignors to Congoleum-Nairn Inc., Kearny, N. J. Filed June 29, 1938. 5 claims. (Cl. 260-19). The coating composition consists of water, an emulsifying agent (ammonium salts of resinates and drying oil soaps), a filler, and a binder containing about 50 to 95 per cent drying oil and 5 to 50 per cent of phenol-aldehyde resins.

2,216,212. Method of and apparatus for making bags and the like. Adolph Potdevin and Paul Hunziker, assignors to Potdevin Machine Company, Brooklyn, N. Y. Filed Nov. 13, 1937. 7 claims. (Cl. 93-19).

2,216,286. Web splicing device. Henry A. Wise Wood, assignor to Wood Newspaper Machinery Corporation, Plainfield, N. J. Filed Oct. 27, 1937. 3 claims. (Cl. 242-58).

2,216,289. Decalcomania transfer. Benjamin Asnes, assignor to Dennison Manufacturing Company, Framingham, Mass. Filed Dec. 10, 1938. 4 claims. (Cl. 41-33). A combination of a backing sheet, a starch sizing layer, a quickly soluble and a moderately soluble adhesive layer, a lacquer coating and a printed design.

2,216,311. Bituminous emulsions and method of producing same. William N. Davis, Orville E. Cushman and Joseph E. Fratis, assignors to Standard Oil Company of California, San Francisco, Calif. Filed May 21, 1938. 13 claims. (Cl. 134-1). The emulsion contains a small proportion of black liquor and an acid-reacting inorganic salt.

2,216,331. Method of an apparatus for producing paper cups. Francis P. Swallow and Frederick C. Smith, assignors to United States Envelope Company, Springfield, Mass. Filed Oct. 28, 1938. 12 claims. (Cl. 93-39.3). A method of applying the bottom of the cup.

2,216,349. Machine for forming liner bags from thin sheet material. Harry L. Jacoby and Isaac L. Wilcox, assignors to Oswego Falls Corporation, Fulton, N. Y. Filed Aug. 16, 1939. 18 claims. (Cl. 93-60).

2,216,362. Protective composition and use thereof. William Courtney Wilson and Paul H. Yoder, assignors to Pyroxylin Products, Inc., Chicago, Ill. Filed Feb. 4, 1937. 12 claims. (Cl. 91-68). A coating composition consisting of the reaction product of rubber with chlorostannic acid and a minor quantity of a water-insoluble metal soap of a fatty acid, the soap increasing the resistance to water-vapor transmission.

2,216,447. Cigarette package forming machine. Adolph Meletti, assignor to Bernard J. Tamarin, Philadelphia, Pa. Filed Feb. 16, 1939. 27 claims. (Cl. 93-6).

2,216,527. Paperboard container and method of making same. Arthur J. Weiss and Harry J. Rossi, assignors to Robert Gair Company, Inc., New York, N. Y. Filed Aug. 23, 1938. 15 claims. (Cl. 229-14).

2,216,536. Process for treating titanium pigments. Willard H. Madson and William H. Daiger, assignors to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed April 21, 1937. 11 claims. (Cl. 134-58). A slurry of calcined titanium dioxide pigment is digested with 0.2 to 10 per cent of added dilute salt for at least 30 minutes at about 100 deg. C.

2,216,580. Shoe stiffener. Richard Almy, assignor to Armstrong Cork Company, Lancaster, Pa. Filed April 27, 1938. 4 claims. (Cl. 36-77). A paper base is saturated with a latex-rosin dispersion and then treated with casein and latex solutions.

2,216,581. Shoe stiffener and method of making the same. Richard Almy, assignor to Armstrong Cork Company, Lancaster, Pa. Filed April 27, 1938. 7 claims. (Cl. 12-146). In the preparation of a normally stiff, resilient shoe stiffener adapted to be rapidly rendered soft and plastic on heating, a fibrous material is impregnated with a neutral thermoplastic material (resins, waxes, bitumens and rubber) in the form of minute particles 1 to 30 microns in size.

2,216,586. Carton lining machine. George F. Burton, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Jan. 13, 1939. 8 claims. (Cl. 93-36.01).

2,216,649. Process of and apparatus for digesting fibrous materials. Albert D. Merrill, Watertown, N. Y. Filed June 27, 1935. 7 claims. (Cl. 92-7). A method of impregnating chips with acid before cooking.

October 8, 1940

2,216,757. Alkali activation of black liquor. George H. Scheffler, assignor to Darco Corporation, Wilmington, Del. Filed March 21, 1939. 6 claims. (Cl. 252-3).

Activated carbon is prepared from black liquor by calcining a mixture of the liquor and an alkali hydroxide in which the ratio of hydroxide to the organic solids in the black liquor is at least 2 to 1, to a temperature of 500 to 600 deg. C., washing the cooled mass with water and maintaining the water content of the carbon at at least 50 per cent until time for use.

2,216,803. Cardboard and cardboard web and method of making same. Albert Benda, assignor to Edge Company, Limited, London, England. Filed Aug. 24, 1939. 6 claims. (Cl. 92-39). A flexible board one-half to several mm. in thickness, provided on opposite surfaces with grooves spaced from 0.5 to 5 mm. apart and having a depth of approximately 5 to 30 per cent of the overall thickness of the board.

2,216,812. Moistureproof sheet material and moistureproofing composition. Robert Barnett Flint, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed April 30, 1938. 23 claims. (Cl. 91-68). A base sheet material is covered with a moistureproof composition comprising a cellulose ester, ether or ether-ester, a moistureproofing agent and a plasticizer (a fatty acid amide).

2,216,817. Papermaking machine. Herman L. Kutter, assignor to The Black-Clawson Company, Hamilton, Ohio. Filed May 2, 1938. 4 claims. (Cl. 92-43). A flow passage for supplying stock to a forming wire, consisting of a series of spaced vertical plates with resilient filler pieces between the plates at the end of the series.

2,216,826. Moistureproof sheet material and moistureproofing composition. James A. Mitchell, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed April 30, 1938. 24 claims. (Cl. 91-68). The plasticizer for the cellulose ester, ether or ether-ester, is an *N*-monoaryl derivative of an amide of a fatty acid.

2,216,827. Cellulose derivative composition of matter and articles produced therefrom. James A. Mitchell, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Sept. 26, 1939. 40 claims. (Cl. 91-68). The plasticizer for the cellulose ester, ether or ether-ester is a *N*-substituted aryl derivative of an amide of an unsaturated aliphatic acid.

2,216,845. Manufacture of paper. Louis L. Larson, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed July 6, 1939. 8 claims. (Cl. 92-21). In the manufacture of grease-proof paper, the pulp is mixed with a size solution containing as the film-former an alkali-soluble cellulose ether, the material is precipitated on the fibers and the pulp is treated with an alkaline swelling agent; before drying the sheet the action of the swelling agent is stopped while the precipitated film-former is in a highly swollen state but before it has been dissolved to the sol state.

2,216,884. Device for opening and resealing cartons. Herbert Kott, assignor to Moistener Corporation, New York, N. Y. Filed Nov. 22, 1938. 16 claims. (Cl. 93-2).

2,216,889. Pigment material and process of making the same. Ray L. McCleary, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed March 16, 1939. 13 claims. (Cl. 134-58). The process consists in wet milling a mixture of calcium carbonate and a polyglycolide. This gives an improved extender material.

2,217,005. Manufacture of sheets containing mineral wool fiber. Albert L. Clapp, Danvers, Mass. Filed Jan. 19, 1938. 9 claims. (Cl. 92-20). A mass of aggregated mineral wool fibers is treated with aqueous viscous slime of at least 1.5 per cent content of sliming agent so as to coat the fiber substantially uniformly with the slime in amount of at least 200 per cent, based on the dry weight of the mass, and agitating the fibers in water to produce a suspension of the liberated fibers.

2,217,165. Sound-deadening material. James E. Graham and Edwin M. Lines, assignors to Bird & Son, Inc., East Walpole, Mass. Filed Jan. 5, 1939. 7 claims. (Cl. 20-4). The sound-deadening material is made up of a series of

layers, including porous open paper felt, with an outer layer of finely divided fibrous materia! and a hardened binder material.

2,217,247. Machine for making sandpaper and other abrasives. Walker Burns, assignor to Behr-Manning Corporation, Troy, N. Y. Filed July 7, 1930. 3 claims. (Cl. 91-44).

2,217,306. Paper widening machine. Harold Griswold Burrill, assignor to Elk Paper Manufacturing Company, Childs, Md. Filed April 25, 1938. 3 claims. (Cl. 154-42). The width of paper is increased by joining together rolls of paper lengthwise; the edges are feathered by a grinding wheel and joined by an adhesive.

2,217,373. Shaking Fourdrinier mechanism. Bernard A. Malkin, assignor to Dominion Engineering Works Limited, Lachine, Quebec, Canada. Filed Nov. 17, 1936. 2 claims. (Cl. 92-45). An improved means of mounting and vibrating table rolls at the wet end of the paper machine.

2,217,493. Method of making reinforced paper bags. George W. Poppe, assignor to Equitable Paper Bag Co., Inc., Brooklyn, N. Y. Filed Oct. 11, 1939. 2 claims. (Cl. 93-35).

2,217,494. Method of making coupon receptacles with closure locks. George W. Poppe, assignor to Equitable Paper Bag Co., Inc., Brooklyn, N. Y. Filed Feb. 29, 1940. 5 claims. (Cl. 93-35).

2,217,504. Method of making knockdown boxes. Samuel Bergstein, assignor to Robert Morris Bergstein, Cincinnati, Ohio, and Frank David Bergstein, as trustees. Filed June 27, 1939. 6 claims. (Cl. 93-49).

2,217,525. Abrasive paper and process of making the same. Nicholas E. Oglesby, assignor to Behr-Manning Corporation, Troy, N. Y. Filed July 6, 1936. 16 claims. (Cl. 51-300). The base paper is treated with a softening agent and one capable of imparting wet strength, saturated with a water-resisting medium (semi-drying oils, drying oils, flexible resins), dried, coated with a flexible, water-resistant binder and then with the abrasive.

2,217,527. Cigarette. Leo Roon, South Orange, N. J., assignor to Roxalin Flexible Lacquer Company, Incorporated. Filed Jan. 22, 1936. 1 claim. (Cl. 131-12). One end of the paper wrapper is externally water-proofed by ethylcellulose.

2,217,591. Paper feed for bread wrapping machines. Arthur A. Kottmann, assignor to Micro-Westco, Inc., Bettendorf, Iowa. Filed Nov. 9, 1938. 5 claims. (Cl. 93-2).

October 15, 1940

2,217,691. High temperature ironing of fiber wetlap. William H. Mason, assignor to Masonite Corporation, Laurel, Miss. Filed June 13, 1939. 8 claims. (Cl. 92-39). Process of making a skin-surfaced, porous fiberboard from a pulp containing lignin by removing the water with squeeze rolls and passing the sheet through press rolls at the rate of 12 to 100 feet per minute and at a temperature of 250 to 400 deg. C. (avoiding the expression of water during the hot-ironing process); area-drying gives a porous fiberboard giving at least one thin-hot-ironed skin surface portion which is relatively compact, dense, smooth, and impervious and adapted to take paint and the like.

2,217,732. External circulating system for pulp digesters. Dion K. Dean, assignor to Foster Wheeler Corporation, New York, N. Y. Filed Dec. 31, 1937. 6 claims. (Cl. 92-7). A tubular strainer for a digester, arranged to provide substantially uniform flow through the strainer.

2,217,784. Container fabricating machine. Racy D. Bennett and Charles Z. Monroe, assignor to The American Paper Bottle Company, Toledo, Ohio. Filed April 23, 1938. 31 claims. (Cl. 93-44.1). Means for squaring-out a collapsed tubular container.

2,217,786. Expander for storage batteries. Howard B. Birt and William C. Pritchard, assignors to General Motors Corporation, Detroit, Mich. Filed Nov. 10, 1937. 8 claims. (Cl. 136-26). A storage battery paste includes as an addition agent a substantially pure sulphonated lignin acid which is substantially free from calcium salts.

2,217,787. Addition agent for storage battery paste. Howard B. Birt, William C. Pritchard and Robert A. Daily, assignors to General Motors Corporation, Detroit, Mich. Filed Oct. 21, 1939. 4 claims. (Cl. 136-26). A battery plate paste includes as an addition agent a sulphonated acid product from hardwood lignin.

2,217,814. Process for manufacturing storage battery paste. William C. Pritchard and Robert A. Daily, assignors to General Motors Corporation, Detroit, Mich. Filed Aug. 8, 1938. 3 claims. (Cl. 136-27). Waste sulphite liquor is precipitated with mineral acid, the lignosulphonic acid is extracted with water and mixed with lead oxide to form a battery paste.

2,218,027. Container and method of making same. Alexander G. Hatch, assignor to Fibre Can Machinery Corporation, Rutland, Vt. Filed March 31, 1938. 15 claims. (Cl. 93-94). Method of forming a can body.

2,218,057. Setup box shaper. George Samuel Spake, Marietta, Ga. Filed Sept. 26, 1939. 5 claims. (Cl. 93-53).

2,218,112. Gumming machine. Kurt Kaufmann, Berlin-Waidmannslust, Germany, assignor to Fritz Kroch. Filed Dec. 31, 1938. 4 claims. (Cl. 91-49).

2,218,116. Method of producing moisture-proof fiber containers. Donald G. Magill, assignor to American Can Company, New York, N. Y. Filed Oct. 5, 1939. 3 claims. (Cl. 93-94). A method of applying a hydrated greaseproof material having a continuous non-impregnating film of wax on its outer surface to a fibrous tube.

2,218,129. Filming machine. Philip C. P. Booty and Raymond G. Booty, assignors to Reichel & Drews, Inc., Chicago, Ill. Filed Sept. 16, 1937. 17 claims. (Cl. 91-50). A machine for applying a film of glue to a panel or the like.

2,218,206. Filter. Orville B. Ackerly, Jr., assignor to Oliver United Filters Incorporated, San Francisco, Calif. Filed June 23, 1936. 9 claims. (Cl. 210-199). A traveling foraminous support on which a layer of wet pulp is carried, a freely rotatable roll in contact with the pulp and means for subjecting the opposed surfaces of the pulp to a differential pneumatic pressure.

2,218,292. Wrapping and sealing machine. Edward A. Muller, Long Island City, N. Y. Filed Dec. 12, 1938. 9 claims. (Cl. 93-2).

2,218,293. Apparatus for wrapping articles. Edward A. Muller, Long Island City, N. Y. Filed Feb. 23, 1939. 3 claims. (Cl. 93-2).

2,218,357. Spectrophotometer and spectrophotometric analysis and prediction. Orrin Weston Pineo, assignor to American Cyanamid Company, New York, N. Y. Filed March 24, 1939. 8 claims. (Cl. 234-1.5).

2,218,373. Process of making laminated articles. George Alexander, assignor to General Electric Company, Schenectady, N. Y. Filed Aug. 7, 1936. 2 claims. (Cl. 154-2). Method of manufacturing a hard, dense, laminated article suitable for refrigerator insulating material by combining fibers with a phenol-formaldehyde resin.

2,218,445. Production of pile surface materials. Harry A. Wintermute, assignor to Behr-Manning Corporation, Troy, N. Y. Filed Sept. 24, 1936. 2 claims. (Cl. 91-70). A mat of pile-forming fibers on an adhesive-coated surface is subjected to the conjoint action of a strong electrical field and mechanical vibration.

2,218,448. Pretreatment of cellulose. Coleman R. Caryl, assignor to American Cyanamid Company, New York, N. Y. Filed June 27, 1939. 3 claims. (Cl. 260-229). Previous to esterification cellulose is heated with alpha-hydroxyisobutyric acid for about two hours.

2,218,449. Apparatus for the preparation of paper stock and the like. Edwin Cowles, assignor to The Cowles Company, Princeton, N. J. Filed Jan. 22, 1937. 9 claims. (Cl. 92-23). A flat screen mounted in a casing, an impeller rotatable within the casing in close proximity to the screen and means to provide a shearing action to cut material entering the opening in the casing.

2,218,474. Plastic and coating composition. Leonard Patrick Moore, assignor to American Cyanamid Company, New York, N. Y. Filed Dec. 17, 1938. 14 claims. (Cl. 260-15). A rapid curing film-forming coating composition yielding light-resistant films comprises a compatible blend of oil acid modified alkyd resin and aminotriazine-aldehyde resin.

2,218,479. Pulping process. Floyd C. Peterson, Midland, Mich., and Louis E. Wise, Winter Park, Fla. Filed Oct. 21, 1936. 19 claims. (Cl. 92-9). The active pulping agent contains at least 15 per cent by weight of an aliphatic amine.

October 22, 1940

2,218,525. Method of and apparatus for manufacturing confection holders. Sol Decker, assignor to Setter Bros. Inc., Cattaraugus, N. Y. Filed March 13, 1935. 21 claims. (Cl. 93-1).

2,218,535. Friction facing and method of making same. Morton F. Judd, assignor to Raybestos-Manhattan, Inc., Passaic, N. J. Filed Sept. 20, 1937. 10 claims. (Cl. 154-2). An asbestos base sheet material and a compound of hardened rubber cement binder.

2,218,547. Method of saturating fibrous stock. Izador J. Novak, assignor to Raybestos-Manhattan, Inc., Bridgeport, Conn. Filed March 29, 1937. 10 claims. (Cl. 92-41). Process of incorporating saturant, binding, etc., when the fibrous web is in a wet stage, this web adhering to the surface of the roll by differential pressures of the inner web and outer liquid levels as it passes through the body of the liquid.

2,218,567. Preparation of alkali hemicellulose. Elwood V. White, assignor to The Dow Chemical Company, Midland, Mich. Filed Sept. 13, 1939. 6 claims. (Cl. 260-209). A mixture of sodium hydroxide, water and a furfural-yielding hemicellulose substantially free from cellulose containing these ingredients in the ratios by weight of caustic soda to hemicellulose of from 1.5 to 14:1 and correspondingly of water to hemicellulose of from 0.8 to 4:1.

2,218,585. Means for and method of closing and sealing the filler opening of containers. Alfred Merkle, assignor to American Sealcone Corporation, New York, N. Y. Filed April 7, 1938. 25 claims. (Cl. 93-6).

2,218,704. Titanium pigment production. Archibald M. Erskine, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed July 23, 1937. 3 claims. (Cl. 134-58). A process for producing a titanium oxide pigment stable and resistant towards lithographic breakdown.

2,218,817. Roll for handling paper. Alfred W. Frost, assignor to Bohn Aluminum & Brass Corporation, Detroit, Mich. Filed Oct. 14, 1938. 6 claims. (Cl. 164-66). Cup-shaped members formed of aluminum alloy.

2,218,836. Manufacture of alkali cullulose. Heinz-Horst E. von Kohorn zu Kornegg, assignor to Oscar Kohorn & Co., Ltd., New York, N. Y. Filed Feb. 19, 1938. 3 claims. (Cl. 23-260). Plant for the continuous manufacture of alkali cellulose.

2,218,969. Blue print coating. Robert Bowling Barnes, assignor to American Cyanamid Company, New York, N. Y. Filed April 2, 1940. 2 claims. (Cl. 95-7). The coating comprises a ferricyanide and ferric guanidine oxalate.

2,219,065. Double backing machine. Hobart W. Bruker and Charles S. Thorn, assignors to George W. Swift, Jr., Inc., Bordentown, N. J. Filed Sept. 24, 1938. 4 claims. (Cl. 154-32). A double-facing machine having a stationery heating table.

2,219,071. Decalcomania. Ferdinand W. Humphner, assignor to Mid-States Gummed Paper Company, Chicago, Ill. Filed April 29, 1936. 6 claims. (Cl. 41-33). A paper base, a heat-responsive release coating, an imprint on the coating which contains a material changing color on the application of a suitable reagent.

2,219,115. Reed fabric. Wade E. Sackner and John E. Millett, assignors to Grand Rapids Fibre Cord Company, Grand Rapids, Mich. Filed July 13, 1938. 1 claim. (Cl. 93-84). An imitation paper reed for furniture manufacture.

2,219,124. Press paper roll chuck. Robert Watson Bandy, Fresno, Calif. Filed Feb. 18, 1939. 3 claims. (Cl. 242-72). An expansion chuck for press rolls.

2,219,263. Sheet abrasive and method of making the same. Francis Gurney Okie, assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn. Filed April 28, 1933. 6 claims. (Cl. 134-79). A composition for forming a sizing coat comprising a cellulose ester (7.2-9.4 parts), a drying oil (8-13.2 parts), resins 2.5-4.5 parts), with mixed solvents for the waterproofing materials.

2,219,278. Sheet abrasive. Francis G. Okie, assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn. Filed June 13, 1938. 4 claims. (Cl. 51-303). A coating formed from a composition for increasing the coefficient of adhesion on the back surface of the sheet, comprising a waterproofing material and a mild friction increasing material.

October 29, 1940

2,219,364. Parasiticide. James Gordon Horsfall and Ross Frisbie Suit; said Horsfall assignor to Cornell Research Foundation, Ithaca, N. Y., and said Suit assignor to Röhm & Haas Company, Philadelphia, Pa. Filed May 6, 1938. 6 claims. (Cl. 167-16). A mixture of cuprous oxide, magnesium oxide, and sulphite waste liquor.

2,219,381. Nonabsorptive material. Philip W. Codwise, assignor to Certain-Teed Products Corporation, New York, N. Y. Filed April 17, 1937. 2 claims. (Cl. 91-68). Process of treating wallboard of fibrous structure formed as a rigid sheet which comprises grinding the edge surface of the sheet and coating with nitrocellulose lacquer.

2,219,398. Segmental pulp wheel. George B. Rickard and Henry P. Kirchner, assignors to The Carborundum Company, Niagara Falls, N. Y. Filed Feb. 9, 1938. 10 claims. (Cl. 51-207). A grinding wheel comprising one or more rings of abrasive segments.

2,219,432. Method of bleaching cellulose. Emil Scheller, assignor to Deutsche Gold and Silber Scheide-Anhalt, Frankfort-on-the-Main, Germany. Filed May 18, 1938. 9 claims. (Cl. 8-109). The use of chlorine, hypochlorite and an active oxygen-yielding compound in weakly alkaline solution substantially free from silicates.

2,219,447. Process for making composite materials. Frazier Groff, assignor to Union Carbide and Carbon Corporation, New York, N. Y. Filed June 19, 1936. 3 claims. (Cl. 154-2). A composite article formed of a fibrous material, a phenol resin and a subsequent coating of a vinyl resin.

2,219,491. Apparatus for making cigarettes. Arthur Podmore, assignor to American Machine & Foundry Company, New York, N. Y. Filed Nov. 22, 1934. 2 claims. (Cl. 93-82). A machine for manufacturing filter tips devices.

2,219,588. Seam for woven wire fabric and method of making the same. Fred Crossman and Earl A. Southam, assignors to The Lindsay Wire Weaving Company, Cleveland, Ohio. Filed Dec. 9, 1939, 9 claims. (Cl. 245-10).

2,219,678. Apparatus for the protection of edges of flat sheets, as paper, linen, or the like. Johann Jacob Bosch, assignor to Rudolph Grohskopf, New York, N. Y. Filed Feb. 12, 1936. 2 claims. (Cl. 93-1).

2,219,682. Sheet cutter for packaging machines. Ralph N. Doble, Hingham, Mass. Filed

Nov. 6, 1937. 5 claims. (Cl. 164-49). Feeding mechanism for feeding web material to a supporting plate.

2,219,697. Article of manufacture. Max Nathan Nickowitz, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Sept. 21, 1939. 2 claims. (Cl. 36-44). The process of laminating a rigid fiberboard with a porous absorbent paper to produce insoles for shoes.

2,219,781. Process for deinking imprinted paper. Richard H. Lowe, assignor to The General Engineering Company, Salt Lake City, Utah. Filed Sept. 8, 1937. 1 claim. (Cl. 92-13). Paper is deinked in an alkaline solution (0.5 to 1 per cent caustic soda) at 140 to 174 deg. F. without washing the defiberized stock, finally adding lime and a reagent having collective properties toward carbon particles and having froth characteristics.

2,219,805. Means for fabricating lath. George A. Buttress, assignor to Buttress Board Company, Los Angeles, Calif. Filed July 28, 1937. 2 claims. (Cl. 154-1). Machine for fabricating bollow ribbed lath.

2,219,853. Production of abrasive material. Frank J. Tone, assignor to The Carborundum Company, Niagara Falls, N. Y. Filed Dec. 31, 1935. 2 claims. (Cl. 51-278). The backing is a plurality of webs united by means of a cement which is relatively stiff and inflexible at ordinary temperature but becomes flexible and plastic on heating.

2,219,856. Microvariable paper machine drive. Milton T. Weston, assignor to West Virginia Pulp & Paper Company, New York, N. Y. Filed Aug. 19, 1936. 4 claims. (Cl. 34-48). A drive which can be varied to produce minute variations in speed of a cylinder to which it is connected to compensate for shrinkage of the paper in drying.

2,219,857. Paper machine drive. Milton T. Weston, assignor to West Virginia Pulp & Paper Company, New York, N. Y. Filed Jan. 7, 1938. 8 claims. (Cl. 34-48). Means for actuating the connections to vary the speed of the individual drier cylinders of the group in an amount to compensate for the shrinkage of paper from one drier cylinder to another.

2,219,979. Coating machine. Lynn B. Case, assignor to John Waldron Corporation, New Brunswick, N. J. Filed Aug. 23, 1939. 16 claims. (Cl. 91-54). And endless strip of felt of uniform porosity is used in combination with a rubber surface roller to transfer the coating material from the fountain roller to the paper.

2,220,047. Heat treatment productive of vegetable fiber products. William H. Mason, assignor to Masonite Corporation, Laurel, Miss. Filed Aug. 19, 1933. 2 claims. (Cl. 92-61). A moist sheet of lignocellulose furnish is pressed to a density of about 0.8, subjected to a temperature of about 315-375 deg. F. until the web is substantially dry and then to a temperature of about 425 deg. F. or over without compacting pressure to increase the dry-and-wet strength by activation of the self-bonding properties.

2,220,056. Paper die cutting machine. Harry Donnerberg and Edma H. Curtis, Jr., assignors to The Nivison-Weiskopf Company, Reading, Ohio. Filed June 23, 1937. 11 claims. (Cl. 164-21).

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2,220,062. Phenol-cellulose resin. Leon E. Champer, assignor to The Chemical Foundation, Incorporated, New York, N. Y. Filed June 4, 1938. 6 claims. (Cl. 260-10). Cellulose produced from the castor bean plant (produced by treatment with 0.16-0.5 *N* nitric acid for about three hours) is reacted with phenol to produce a thermosetting synthetic resin.

2,220,073. Mechanism for feeding blanks. Daniel Belcher, Bradford R. Stetson, and Harold V. Kindseth, assignors to Bemis Bro. Bag Co., Minneapolis, Minn. Filed April 28, 1938. 6 claims. (Cl. 271-12).

2,220,116. Production of cadmium colors. James J. O'Brien, assignor to The Glidden Company, Cleveland, Ohio. Filed Jan. 29, 1938. 12 claims. (Cl. 134-58). The pigment is treated in a calcination zone in an atmosphere which is at least partially reducing and produced by the volatilization of a volatile nitrate.

2,220,117. Method of making cadmium sulphide pigments. James J. O'Brien, assignor to The Glidden Company, Cleveland, Ohio. Filed Jan. 5, 1939. 4 claims. (Cl. 134-58). Cadmium metal is reacted with a mixture of sulphuric acid, nitric acid and water.

2,220,140. Abrasive sheet material. Howard G. Bartling and Ellsworth B. Overshiner, assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn. Filed March 15, 1933. 5 claims. (Cl. 51-303).

2,220,270. Process and apparatus for perforating sheet materials. John Page, assignor to United States Gypsum Company, Chicago, Ill. Filed Oct. 11, 1937. 27 claims. (Cl. 164-99).

2,220,289. Method of treating calcium sulphate. Harold F. Saunders and Clovis H. Adams, assignors to The Sherwin-Williams Company, Cleveland, Ohio. Filed Nov. 22, 1937. 3 claims. (Cl. 134-58). Iron is removed by treating with an alkaline earth metal phosphate, and sulphuric acid and calcining at a temperature of about 500 deg. C.

2,220,367. Bread wrapping machine. Israel C. Gellman, assignor to Gellman Manufacturing Co., Rock Island, Ill. Filed March 8, 1937. 26 claims. (Cl. 93-2).

2,220,386. Method of manufacturing sheet asbestos products. Marion S. Badollet, assignor to Johns-Manville Corporation, New York, N. Y. Filed Dec. 23, 1936. 5 claims. (Cl. 92-21). The coagulating medium is a sulphonated oil, sulphonated alcohol or sulphonated olefin in the amount of 0.2 to 1 per cent based on the weight of the asbestos fibers.

2,220,390. Apparatus for manufacture of cardboard and like boxes. Edwin Leslie Bishop, Birmingham, England. Filed June 8, 1939. 2 claims. (Cl. 93-53). Apparatus for applying adhesives to the tabs of a box blank.

2,220,426. Method treating cellulose fibers. William Beach Pratt, assignor to Aldox Corporation, Dover, Del. Filed Aug. 15, 1938. 4 claims. (Cl. 8-108). The cellulose fibers are treated with formaldehyde at a temperature and for a time sufficient to impregnate the fibers and then treating with an oxidizing bleaching agent activated by formaldehyde.

2,220,459. Device for inserting necks in box bodies. Johannes Schmiedel, assignor to "Universelle" Cigarettenmaschinenfabrik J. C. Mueller & Co., Dresden, Germany. Feb. 25, 1939. 8 claims. (Cl. 93-55).

2,220,624. Process for the hydrogenation of lignin and waste pulp liquors and the products thereof. Earl C. Sherrard, Elwin E. Harris, and Jerome F. Saeman, assignors to Henry A. Wallace, Secretary of Agriculture of the United States of America and to his successors in office. Filed July 15, 1939. 19 claims. (Cl. 260,-124). Catalytic reduction of lignin in an aqueous medium at about 300 deg. C. gives methanol, propylcyclohexane and its derivatives, and water-insoluble resins.

2,220,676. Method and apparatus for refining stock. Edwin Cowles, assignor to The Cowles Company, Princton, N. J. Filed July 29, 1937. 7 claims. (Cl. 92-26). Method of refining paper stock which comprises spinning the pulp at relatively high velocity in a substantially cylindrical chamber having a perforated screen.

2,220,677. Machine for refining paper stock. Edwin Cowles, assigner to The Cowles Company, Princeton, N. J. Filed Sept. 16, 1937. 1 claim. (Cl. 92-26). A metal scraper is mounted on the impeller which moves along the perforated screen in the refining apparatus.

2,220,682. Method of bleaching fibers of vegetable origin. Hans O. Kauffmann and Harry G. Smolens, assignors to Buffalo Electro-Chemical Company, Inc., Buffalo, N. Y. Filed May 10, 1939. 6 claims. (Cl. 8-111). The use of an alkaline bleaching solution including a per-compound.

2,220,804. Method of treating cellulosic fibrous materials. William Beach Pratt, assignor to Aldox Corporation, Dover, Del. Filed May 12, 1937. 4 claims. (Cl. 8-116). A method of treating cellulose fibers with formaldehyde, this being a step in the ultimate hydration thereof.

2,220,853. Supporting stand for dandy roll. Peter S. Sinclair, Holyoke, Mass. Filed May 25, 1936. 9 claims. (Cl. 92-48). A dandy roll, a plurality of water-wheel buckets circumferentially disposed around one end of the roll, a jet nozzle to impinge a stream of water against the buckets, and connections for supplying water under pressure to the nozzle.

2,220,873. Bag and method of making same. Harry F. Waters, New York, N. Y. Filed Jan. 26, 1938. 3 claims. (Cl. 229-53).

2,220,874. Method for the manufacture of containers. Harry F. Waters, New York, N. Y. Filed Oct. 20, 1937. 4 claims. (Cl. 93-35).

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2,220,921. Apparatus for applying flock. Wayne B. Thompson, assignor to Spray Engineering Company, Somerville, Mass. Filed Aug. 27, 1936. 14 claims. (Cl. 91-8).

2,220,943. Adhesive applying machine. John H. Murch, assignor to American Can Company, New York, N. Y. Filed Dec. 8, 1938. 5 claims. (Cl. 91-46). A pre-melting pot for thermoplastic adhesive and the like.

2,220,960. Carton forming machine. Emil G. Jurgens and Hazen K. Becker, assignors to Peters Machinery Company, Chicago, Ill. Filed June 7, 1939. 2 claims. (Cl. 93-44.1).

2,220,987. Remoistening adhesive. Hans F. Bauer, Jordan V. Bauer, and Don M. Hawley, assignors to Stein, Hall Manufacturing Company, Chicago, Ill. Filed Jan. 20, 1939. 13 claims. (Cl. 134-23.4). A British gum (less than 55 per cent dextrin), 1-5 per cent borax, 3-30 per cent of a water soluble inorganic nitrate, and 1-10 per cent of glycerin.

2,220,988. Adhesive of the remoistening type. Hans F. Bauer, Jordan V. Bauer, and Don M. Hawley, assignors to Stein, Hall Manufacturing Company, Chicago, Ill. Filed Jan. 28, 1939. 13 claims. (Cl. 134-23.4). The same as the above but with a thiocyanate in place of the nitrate.

2,221,065. Fiber cutter. Charles J. Westin, assignor to F. J. Stokes Machine Company, Philadelphia, Pa. Filed July 16, 1938. 6 claims. (Cl. 164-68).

2,221,066. Process for the recovery of the sulphurous acid produced in the sulphite cellulose cooking process. Friedrich-Wilhelm Kahle, assignor to Zellstoffabrik Waldhof, Mannheim-Waldhof, Germany. Filed Feb. 3, 1938. 5 claims. (Cl. 23-178). A method of collecting in a vessel of variable volume, at a low, substantially constant pressure, the whole of the sulphur dioxide evolved from the spent liquor upon the discharge of the latter from the digester and spraying a liquid into said vessel, thereby dissolving the collected sulphur dioxide in the liquid.

2,221,197. Milk bottle cap and method of making the same. Harold W. Martin, assignor to American Seal-Kap Corporation of Deleware, Long Island City, N. Y. Filed May 7, 1936. 9 claims. (Cl. 18-56). Method of making a rigid molded paper article from a blank of waxed paper.

2,221,200. Method and apparatus for forming articles from paper pulp. Eugene L. Perry, Rochester, Mich. Filed May 11, 1937. 6 claims. (Cl. 92-39). Apparatus for forming a corrugated sheet from paper pulp.

2,221,282. Preparation of lignin-phenol resin. Leon E. Champer and Leo M. Christensen, assignors to The Chemical Foundation, Incorporated, New York, N. Y. Filed April 13, 1937. 1 claim. (Cl. 260-47). Lignin (250 parts by weight), 600 parts of phenol and 7.5 parts of sulphuric acid are reacted at 150 to 160 deg. C. and the reaction product is polymerized at 1000 pounds pressure at 160 to 180 deg. C. to form an insoluble, infusible resin.

2,221,294. Decolorizing paper stock. Alfred O. Bragg, assignor to Diamond Alkali Company, Pittsburgh, Pa. Filed Oct. 28, 1938. 13 claims. (Cl. 8-102). A nickelous compound is used as a catalyst in treating paper stock with aqueous alkaline solution.

2,221,310. Fabricated insulation. Michel S. Gazelle, assignor to Insulfoil Corporation of America, Detroit, Mich. Filed Aug. 26, 1937. 4 claims. (Cl. 154-45). A sheet of paper, a bright metal foil secured to its surface and a sheet of cellophane having a series of projections and recesses to provide a series of dead air spaces.

2,221,329. Art of treating leatherboard. Herman W. Richter, assignor to George O. Jenkins Company, Bridgewater, Mass. Filed Nov. 18, 1936. 15 claims. (Cl. 92-40). Method of making sheet leatherboard having a varicolored cross section and at least one cross-sectional zone of a color different from the color imparted by the leatherboard stock.

2,221,341. Method of preparing petroleum waxes for coating containers. George D. Beal, assignor to Continental Can Company, Inc., New York, N. Y. Filed May 21, 1938. 1 claim. (Cl. 196-21).

2,221,420. Article of manufacture. George W. Clarvoe and Lester A. H. Baum, assignors to Johns-Manville Corporation, New York, N. Y. Filed Nov. 18, 1937. 9 claims. (Cl. 260-41). A dense, nonwarping, water-resistant board comprising a calcareous cementing material, fibers distributed throughout and a resinous polymerized olefin composition impregnated into the article.

2,221,441. Coating evening means for paper laminating machines. George W. Charters, Camas, Wash. Filed Jan. 15, 1940. 5 claims. (Cl. 91-33).

2,221,443. Mouthpiece cigarette manufacture. Glenn Davidson, Aurora, Ill. Filed April 28, 1936. 11 claims. (Cl. 93-1).

2,221,481. Electric control mechanism for bread wrapping machines. Thormod Jensen, Laurelton, N. Y., assignor to American Machine & Foundry Company, Filed Aug. 19, 1938. 5 claims. (Cl. 192-125).

2,221,484. Method for bonding surfaces. Carl C. Kesler, assignor to Penick & Forl, Ltd., Incorporated, Cedar Rapids, Iowa. Filed Feb. 21, 1938. 10 claims. (Cl. 154-40). Borax is applied to one surface and cooked starch to at least one of the surfaces and the two surfaces are brought into contact to effect a bond between them.

2,221,617. Method of making handled shopping bags. Harford K. Steen, Newburgh, N. Y. Filed Jan. 19, 1938. 5 claims. (Cl. 93-35).

2,221,628. Blueprint coating. Robert Bowling Barnes, Garnet Philip Ham, and Leonard Patrick Moore, assignors to American Cyanamid Company, New York, N. Y. Filed April 16, 1940. 6 claims. (Cl. 95-7). The composition contains a light-sensitive ferric salt, a ferricyanide and a complex alkali metal amino-amidine ferrocyanide.

2,221,696. Apparatus for forming a woven wire belt. Walter C. Sutton, assignor to The Lindsay Wire Weaving Company, Cleveland, Ohio. Filed Sept. 21, 1939. 39 claims. (Cl. 140-3).

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2,221,778. Acid-resistant resin products. William R. Collings, Richard D. Freeman, and Richard M. Upright, assignors to The Dow Chemical Company, Midland, Mich. Filed Feb. 25, 1938. 11 claims. (Cl. 260-51). Lignin is

digested with an aqueous solution of a water-soluble salt of a phenol, the resulting product is condensed with an aldehyde and the resin precipitated with acid.

2,221,779. Acid-resistant resin product. William R. Collings, Richard D. Freeman; and Richard M. Upright, assignors to The Dow Chemical Company, Midland, Mich. Filed Feb. 25, 1938. 9 claims. (Cl. 260-10). Lignocellulosic material is treated as in patent 2,221,778.

2,221,873. Production of mat light-sensitive photographic paper. Julius Knoefel, assignor to General Aniline & Film Corporation, New York, N. Y. Filed Feb. 25, 1938. 7 claims. (Cl. 95-8).

2,221,945. Molded sheet composition and process of preparing same. Norman D. Hanson, assignor to Union Carbide and Carbon Corporation, New York, N. Y. Filed Nov. 19, 1936. 12 claims. (Cl. 92-21). A mixture of short and long fibered pulp and a heat-hardenable resin is intimately blended by hot rolling, formed into sheets and dried.

2,221,990. Vacuum stripper for cartons. John Munn and Alexander H. Burnett, Chicago, Ill. Filed April 7, 1939. 12 claims. (Cl. 93-51.1).

2,221,996. Loading and wrapping means. Charles H. Petskeyes and Israel C. Gellman, assignors to Gellman Manufacturing Company, Rock Island, Ill. Filed Feb. 27, 1939. 12 claims. (Cl. 93-2).

2,222,003. Means for producing articles of fibrous composition. Edward C. Sloan, assignor to Jesse B. Hawley, Geneva, Ill. Filed March 28, 1936. 4 claims. (Cl. 92-60). Method of drying a molded article.

2,222,011. Joint-sealing device dependent on an application of heat and pressure. Walter R. Zwoyer, assignor to Transparent-Wrap Machine Corporation, New York, N. Y. Filed Oct. 6, 1939. 8 claims. (Cl. 93-3).

2,222,198. Aluminum phosphate pigmented paper. Louis C. Fleck, assignor to Paper Patents Company, Neenah, Wis. Filed July 1, 1937. 9 claims. (Cl. 92-21). A paper sheet containing a filler material at least 5 per cent of which is an aluminum phosphate pigment, the sheet containing at least one per cent of said pigment.

2,222,199. Pigmented paper and process of making same. Louis C. Fleck, assignor to Paper Patents Company, Neenah, Wis. Filed July 5, 1938. 12 claims. (Cl. 92-21). The essential elements of the filler are aluminum phosphate and calcium sulphite, the pigmenting material being made up of at least five per cent of the phosphate pigment.

2,222,343. Composite sheathing and insulating material. Max Wasserman, assignor to Wasco Flashing Co., Cambridge, Mass. Filed May 19, 1938. 6 claims. (Cl. 154-44). A noncorrodible metal foil at least one face of which carries a metal-coated creped paper sheet.

2,222,469. Apparatus for making paper. Casper E. Youngchild, assignor to International Paper Company, New York, N. Y. Filed Oct. 17, 1936. 1 claim. (Cl. 92-44). The breast roll has a uniform diameter throughout the greater portion of its width with its ends decreased in diameter; the wire has a width equal to the overall length of the roll and greater than the effective drainage area of the suction device.

2,222,532. Sheet material. John Eggert and Bruno Wendt, assignors to Walter H. Duisberg, New York, N. Y. Filed March 8, 1934. 14 claims. (Cl. 91-68). A wrapping material contains compounds which absorb ultraviolet rays. A list of these compounds is given in the patent.

2,222,539. Method of and apparatus for making pile-surfaced sheets. Archibald F. Meston, assignor to Behr-Manning Corporation, Troy, N. Y. Filed Dec. 11, 1934. 15 claims. (Cl. 154-2).

2,222,541. Bag machine. Howard H. Orr, assignor to The Jaite Company, Jaite, Ohio. Filed Dec. 30, 1937. 5 claims. (Cl. 93-8).

2,222,572. Wallboard construction. Burt B. Reger, assignor to The Deco-Board Corporation, Parkersburg, W. Va. Filed July 15, 1937. 3 claims. (Cl. 20-15). A sheet of corrugated paper between two relatively stiff sheets having along one edge an overlap formed by extending one of the stiff sheets beyond the corrugated paper.

2,222,573. Wallboard construction. Burt B. Reger, assignor to The Deco-Board Corporation, Parkersburg, W. Va. Filed June 27, 1938. 4 claims. (Cl. 20-15). Two adjacent corrugated layers between two outside sheets of relatively thick paper.

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R21,631. Process for removing and recovering sulphur dioxide from waste gases. Henry F. Johnstone, assignor to Commonwealth Edison Company, Chicago, Ill. Original No. 2,082,006, dated June 1, 1937. Application for reissue Oct. 3, 1938. 11 claims. (Cl. 23-178).

2,222,630. Impregnating apparatus. George Pickford and Bernard S. Lee, assignors to United Shoe Machinery Corporation, Borough of Flemington, N. J. Filed Oct. 3, 1938. 49 claims. (Cl. 91-46).

2,222,633. Apparatus for manufacturing fiberboard. Horace A. Sheesley, assignor to Tufide Products Corporation, Portland, Me. Filed Dec. 1, 1936. 8 claims. (Cl. 154-1). Means for reducing fibrous stock to a loosely piled mass of fibers, a suction element for forming a predetermined unstratified layer of the fibers, a method of projecting a binder into the fibrous layer and means for compacting the layer into a self-sustaining web.

2,222,760. Screening apparatus. Joseph Baxter, Jr., assignor to The Black-Clawson Company, Hamilton, Ohio. Filed Dec. 8, 1937. 7 claims. (Cl. 210-149).

2,222,815. Flowerpot liner and fertilizer container. Ragnar O. Johnson, Pasadena, Calif. Filed April 19, 1939. 1 claim. (Cl. 71-64). The flowerpot is made of paper which readily disintegrates in water with a corrugated strip arranged to carry fertilizer.

2,222,868. Roofing and siding. Lawrence A. Hollister, Williams Bay, Wis. Filed June 9, 1938. 7 claims. (Cl. 108-7).

2,222,872. Water insoluble or water-resistant starch product. Gerald J. Leuck, assignor to Corn Products Refining Company, New York, N. Y. Filed Dec. 10, 1937. 13 claims. (Cl. 134-23.4). The starch is dehydrated and mixed with formaldehyde and an acid.

2,222,873. Water resistant starch and process. Gerald J. Leuck, assignor to Corn Products Refining Company, New York, N. Y. Filed Dec. 10, 1937. 16 claims. (Cl. 134-23.4). Starch is reacted with an alkali and then mixed with formaldehyde and an acid.

2,222,874. Dehydrated starch. Gerald John Leuck, assignor to Corn Products Refining Company, New York, N. Y. Filed Nov. 25, 1938. 2 claims. (Cl. 127-71). Starch from which adsorbed and absorbed water has been removed is characterized by the capacity to form with formaldehyde a cohesive and adhesive plastic.

2,222,875. Alkali treated starch and process for making same. Gerald John Leuck, assignor to Corn Products Refining Company, New York, N. Y. Filed Dec. 15, 1938. 2 claims. (Cl. 127-33). An alkali-treated starch is characterized.

2,222,956. Coated paper. John H. Seaton, assignor to The B. F. Goodrich Company, New York, N. Y. Filed Oct. 20, 1937. 1 claim. (Cl. 154-50). Paper having on its surface a uniform adherent film of gelled plasticized gamma-polyvinyl chloride adherently calendered thereto.

2,222,973. Art of increasing fading resistance of dyestuffs. Johan Bjorksten, assignor to Ditto, Incorporated, Chicago, Ill. Filed Feb. 7, 1938. 9 claims. (Cl. 101-149.5). A copy paper adapted for use in a transfer process.

2,223,240. Laminated cellulosic material. Everett C. Hughes, assignor to The Standard Oil Company, Cleveland, Ohio. Filed Oct. 19, 1937. 9 claims. (Cl. 154-46). The laminating material is an oilproof layer of sodium silicate modified by a minor proportion of sodium sulphide.

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2,223,390. Wire fabric and method of making the same. Otto Carl Scherfel, assignor to Audubon Wire Cloth Corporation, Philadelphia, Pa. Filed Oct. 15, 1938. 20 claims. (Cl. 245-6).

2,223,476. Method for making pile fabric. John O. Amstuz, Troy, N. Y. Filed Nov. 2, 1936. 12 claims. (Cl. 91-68). The sheet material and the comminuted material are fed into an electrostatic field of alternating potential.

2,223,575. Adhesive compositions. Earle C. Pitman, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed July 15, 1936. 1 claim. (Cl. 134-79). A modified alkyd resin, cellulose nitrate and a plasticizer.

2,223,770. Method of making display receptacles. Reginald A. Nagle, assignor to Flower City Specialty Company, Rochester, N. Y. Filed May 9, 1938. 13 claims. (Cl. 93-36). A method of forming a cover section of an article display receptacle.

2,223,850. Process for refining and obtaining valuable products from tall oil. Frederick H. Gayer and Charles E. Fawkes, assignor to Continental Research Corporation, Chicago Heights, Ill. Filed Oct. 18, 1937. 15 claims. (Cl. 260-97.5). Tall oil is treated at a temperature below about 30 deg. C. with sulphuric acid in sufficient quantity to precipitate the coloring matter and a substantial portion of the unsaponifiable matter including phytosterol.

2,223,877. Pulp producing apparatus. Herbert R. Simonds, assignor to Simonds Worden White Company, Dayton, Ohio. Filed Feb. 15, 1939. 6 claims. (Cl. 92-22). A bedplate for a beater.

2,223,878. Clamp for paper cutters. William R. Spiller and John R. Lehman, assignors to Harris-Seybold-Potter Company, Cleveland, Ohio. Filed Nov. 21, 1939. 18 claims. (Cl. 164-54).

2,224,009. Abrasive article and method of manufacturing the same. Joseph B. Aust, assignor to The Carborundum Company, Niagara Falls, N. Y. Filed Feb. 24, 1939. 7 claims. (Cl. 51-295). A paper web high in alpha-cellulose content is treated with a hygroscopic material and a tanning agent for a protein adhesive and then with abrasive grains and a protein adhesive.

2,224,017. Container and method of making same. Irving Gurwick, assignor to Shellmar Products Company, Mount Vernon, Ohio. Filed June 16, 1937. 3 claims. (Cl. 93-35).

2,224,035. Adhesive composition. John H. Long, assignor to Hercules Powder Company, Wilmington, Del. Filed April 1, 1938. 6 claims. (Cl. 260-75). Esterification products of a terpene-maleic anhydride condensate and a glycol.

2,224,040. Machine for positioning string handles on bags. Carleton G. Eaton and Alfred J. Thomas, assignors to A. M. Eaton Paper Company, Boston, Mass. Filed June 17, 1937. 7 claims. (Cl. 93-8).

2,224,044. Method and apparatus for the chemical analysis of materials by thermal decomposition. Charles B. Francis, Pittsburgh, Pa., Henry J. Wolthorn, Hubbard, and Truman S. Woodward, Youngstown, Ohio. Filed May 9, 1939. 1 claim. (Cl. 23-230). Method for determining sulphur in sulphates and sulphites in a material that is thermally decomposable.

December 10, 1940

2,224,129. Method of making paper cups. Walter E. Amberg, assignor to Universal Paper Products Company, Chicago, Ill. Filed Feb. 8, 1939. 5 claims. (Cl. 93-36.2).

2,224,135. Making board products and recovering water solubles from fibrous lingocellulose material. Robert M. Boehm, assignor to Masonite Corporation, Laurel, Miss. Filed Dec. 1, 1936. 6 claims. (Cl. 92-2). A method of subjecting coarsely subdivided lignocellulosic material to the action of steam at 600 to 1000 pounds pressure, removing the liquor containing the water-soluble material by mechanical expression and making the fibrous portion into board.

2,224,150. Electrolytic condenser. Hal F. Fruth, assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind. Filed Nov. 15, 1934. 14 claims. (Cl. 175-315). A laminated spacer consists in part of soft absorbent paper.

2,224,220. Partition assembling machine. Charles G. Dauber, assignor to The Dauber Company, Oshkosh, Wis. Filed June 23, 1939. 3 claims. (Cl. 93-37).

2,224,248. Apparatus for testing the crush strength of paper. Robert J. Blum, Indian Hill, and Maurice W. Gilbert, Lockland, Ohio. Filed July 10, 1939. 3 claims. (Cl. 265-14).

2,224,323. Wire fabric seam. William J. Taylor, Nutley, N. J. Filed May 24, 1939. 7 claims. (Cl. 245-10).

2,224,370. Art of laminating materials. William B. Wescott, assignor to Addressograph-Multigraph Corporation, Wilmington, Del. Filed Feb. 19, 1937. 6 claims. (Cl. 154-40). Method of laminating two webs of paper, one of which bears a layer of thermoplastic adhesive.

2,224,489. Process of improving fibrous material. Meindert Danius Rozenbroek, Delden, Twenthe, Overijsel, Netherlands. Filed May 1, 1937. 7 claims. (Cl. 8-143). Method of increasing the wetting properties of organic fibrous materials by alternately drying and humidifying the material with water vapor at 60 deg. C.

2,224,510. Egg carton and egg filler assembling machine. Joseph Leopold Coyle, Toronto, Ontario, Canada. Filed Nov. 12, 1938. 38 claims. (Cl. 93-37).

2,224,513. Method of making envelopes without side flaps. Gunnar Holmlund, assignor to Maria (Majen) Lindgren, Goteborg, Sweden. Filed Sept. 9, 1939. 4 claims. (Cl. 93-35).

2,224,520. Coating and filling material. Howard D. Meincke, Glencoe, Ill., assignor to A. M. Meincke & Son, Inc. Filed July 29, 1939. 8 claims. (Cl. 134-16). An inert filler and colloidal magnesium-calcium silicate.

2,224,656. Paper or like bag making machine. Foster Gotch Robinson, assignor to Paper Sacks Limited, Bristol, England. Filed May 14, 1940. 18 claims. (Cl. 93-27).

2,224,713. Creped and corrugated web. William Wallace Rowe and Warren A. Morris, assignors to The Paper Service Company, Lockland, Ohio. Filed Aug. 19, 1937. 4 claims. (Cl. 154-55). The web is characterized by transversely extending creping crinkles and by longitudinally extending corrugations crushed to form folds.

2,224,716. Carton sealing machine. Gustaf W. Anderson, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Nov. 15, 1938. 7 claims. (Cl. 93-6).

2,224,777. Chalk resistant titanium pigment. James E. Booge, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed March 18, 1939. 17 claims. (Cl. 134-58).

2,224,779. Packet making apparatus. John Walker Chalmers and David Blewes Kidd, assignors to Molins Machine Company, Limited, London, England. Filed June 27, 1938. 11 claims. (Cl. 93-12).

2,224,803. Apparatus for drying paper. Albert H. Standley, assignor to Downingtown Manufacturing Company, Downingtown, Pa. Filed Sept. 30, 1937. 1 claim. (Cl. 34-48). Apparatus for controlling the moisture content of paper sheets.

2,224,810. Air-cell pipe covering and method of forming the same. Donald A. Cumfer, assignor to United States Gypsum Company, Chicago, Ill. Filed Nov. 29, 1937. 12 claims. (Cl. 154-28).

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2,224,857. Tool for use in assembling and disassembling the siphons of drier drums. Hervey G. Cram, Appleton, Wis. Filed Sept. 16, 1937. 3 claims. (Cl. 29-84). A tool for as-

sembling and disassembling the horizontal and vertical legs of a siphon of a drier drum.

2,224,881. Machine for making pulp articles. Edward M. Patterson, Whittier, and Ray O. Wilson, Los Angeles, Calif., assignors to Plastic Fibre Corp. Filed Dec. 28, 1936. 1 claim. (Cl. 92-59). A molding press.

2,224,976. Process and apparatus for digesting fibrous material. Albert D. Merrill, Watertown, N. Y. Filed June 26, 1935. 5 claims. (Cl. 92-7). A method of circulating liquor and gas in a digester.

2,224,987. Titanium dioxide pigment and printing ink containing the same. Friedrich Raspe and Robert William Ancrum, assignors to Titan Company, Inc., Wilmington, Del. Filed July 12, 1939. 7 claims. (Cl. 134-35).

2,224,992. Resin-impregnated sheet material and process for producing the same. Leslie T. Sutherland, assignor to The Barrett Company, New York, N. Y. Filed June 26, 1935. 13 claims. (Cl. 154-2). A continuous process of producing a resin-impregnated fibrous web.

2,225,100. Manufacture of sheets or boards containing mineral wool. Albert L. Clapp, Danvers, Mass. Filed May 9, 1938. 10 claims. (Cl. 92-21). Mineral wool fibers and a water-insoluble soap slime.

2,225,134. Method of making fibrous sheet material. Max Skolnik, Chicago, Ill. Filed June 19, 1937. 9 claims. (Cl. 92-56). A die box and screen die for forming a molded sheet.

2,225,187. Wire handling machine. Claude M. Stitt, Harry C. Stone, and Floyd B. Stone, assignors to Fibreboard Products Inc., San Francisco, Calif. Filed Jan. 23, 1939. 13 claims. (Cl. 140-71).

2,225,256. Coating composition. William P. Colio, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed July 6, 1938. 5 claims. (Cl. 260-3). A heat hardening urea-formaldehyde resin and from 0.05 to 4.5 per cent of chlorinated rubber.

2,225,288. Method of manufacturing bags. Walter E. Woehlert, assignor to The Dobeckmun Company, Cleveland, Ohio. Filed July 21, 1937. 13 claims. (Cl. 93-35).

2,225,295. Method of applying wax carbon to paper. Donald L. Boyd, assignor to Carb-O-Spot Corporation, Athens, Ohio. Filed Oct. 26, 1939. 4 claims. (Cl. 91-70).

2,225,387. Production of cooked acid casein. Vernon J. Lowe and Arthur W. Bean, Marengo, Ill. Filed July 13, 1938. 8 claims. (Cl. 260-120).

2,225,435. Paper making machine. William R. Kellett and Harry M. Ostertag, assignors to Paper Patents Company, Neenah, Wis. Filed Aug. 6, 1936. 14 claims. (Cl. 92-44). A hydraulic inlet structure for a Fourdrinier paper-making machine.

2,225,459. Method of separating the heart and sap wood constituents of coniferous woods. George V. Palmrose, assignor to Weyerhaeuser Timber Company, Longview, Wash. Filed July 29, 1939. 8 claims. (Cl. 209-173). A method of treating a mixed mass of the heart and sapwood chips to increase the apparent specific gravity of the sapwood relative to that of the heartwood and separating the two by the difference in their apparent specific gravities.

2,225,536. Decalcomania. Ferdinand W. Humphner, assignor to Mid-States Gummed Paper Company, Chicago, Ill. Filed Nov. 2, 1936. 2 claims. (Cl. 41-33). The base is a sheet of waterleaf paper with reinforcing fibers.

2,225,585. Method of making textured fiberboard. James N. Devereux, assignor to United States Gypsum Company, Chicago, Ill. Filed April 12, 1937. 1 claim. (Cl. 92-39). Method of making a haphazardly textured uneven-surfaced fiberboard.

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2,225,630. Scoring device for sample paper boxes. Clyde L. Gilbert, assignor to The Craftsman Equipment Corporation, Elkhart, Ind. Filed July 29, 1938. 21 claims. (Cl. 164-73).

2,225,664. Coating composition. Alfred Siegel, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Dec. 1, 1937. 4 claims. (Cl. 260-40). A synthetic alky resin enamel and a nonbleeding, insoluble pigment.

2,225,744. Process of removing and recovering sulphur dioxide. Henry F. Johnstone, assignor to Commonwealth Edison Company, Chicago, Ill. Filed Aug. 25, 1938. 6 claims. (Cl. 23-178). The absorbing solution is treated with boric acid and a polyhydroxy organic compound which decreases the sulphur dioxide capacity of the heated solution.

2,225,771. Method of digesting fibrous material. Thomas L. Dunbar, assignor to Chemipulp Process Inc., Watertown, N. Y. Filed Oct. 21, 1936. 11 claims. (Cl. 92-11). A method of digesting fibrous material with acid and circulating the cooking liquors, with means for absorbing the hot high pressure fluids evolved during the digestion operation.

2,225,831. Fireproofing composition. Walter Herz, Vienna, Austria. Filed March 29, 1935. 9 claims. (Cl. 134-78.6). A mixture of approximately equal quantities of borax, acid ammonium phosphate, and alkaline ammonium chloride with about 10 per cent of irradiated dextrin as an adhesive agent.

2,225,877. Method and apparatus for manufacturing granular coated webs. Romie L. Melton, Raymond C. Benner, and Henry P. Kirchner, assignors to The Carborundum Company, Niagara Falls, N. Y. Filed Sept. 22, 1939. 11 claims. (Cl. 91-33). A liquid adhesive is applied to the granular surface of a web previously coated with granular particles and a high velocity stream of gas is directed against the adhesive layer to clear the peaks of the granular particles from the adhesive.

2,225,888. Wrapping of cigarettes and other articles. Alfred German Rose, assignor to Rose Brothers (Gainsborough) Limited, Gainsborough, England. Filed Feb. 2, 1940. 17 claims. (Cl. 93-2).

2,225,906. Underlay for floor coverings. Oscar Lawrence Dallia, Chicago, Ill. Filed April 12, 1937. 1 claim. (Cl. 154-49). An asphalt felt with a wax film.

2,225,923. Preparation of hypochlorites. Irving E. Muskat and George H. Cady, assignors to Pittsburgh Plate Glass Company, Allegheny County, Pa. Filed July 23, 1938. 6 claims. (Cl. 23-86). Bleaching powder is treated with a mixture which initially contains chlorine and chlorine monoxide.

2,225,927. Cover clamping and tucking mechanism for match booking machine. Eric P. Olson, assignor to The Diamond Match Company, New York, N. Y. Filed Oct. 7, 1939. 8 claims. (Cl. 93-2).

2,225,937. Manufacture of abrasive coated products. John A. Williamson, assignor to The Carborundum Company, Niagara Falls, N. Y. Filed May 23, 1939. 11 claims. (Cl. 51-293). A coating of adhesive is applied to the moving web and the excess is removed by a jet of gas containing a vapor of a solvent for the adhesive.

2,226,147. Pigment substance and process for producing the same. Joseph Bartlett Sutton, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Jan. 23, 1940. 16 claims. (Cl. 134-58). The gloss of a pigment may be improved by the addition of a quaternary ammonium base.

2,226,181. Manufacture of cartons. Andrew R. Ridderstrom, assignor to Prime Manufacturing Company, Lynn, Mass. Filed Jan. 13, 1940. 2 claims. (Cl. 93-56). A process of reinforcing box blanks.

2,226,356. Process of purifying cellulosic material. Joseph L. McCarthy, Harold Hibbert, and George H. Tomlinson, assignors to Canada Paper Company, Montreal, Quebec, Canada. Filed March 9, 1939. 10 claims. (Cl. 8-108). The chlorine treatment is preceded by acidification of the material to a pH value not greater than 3 by the addition of a nonoxidizing acid.

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2,226,553. Sheeted cellulosic material and abrasive article and process of making the same. Bert S. Cross, assignor to Minnesota Mining & Manufacturing Co., St. Paul, Minn. Filed April 12, 1933. 17 claims. (Cl. 51-185). A plurality of associated sized and unsized laminated layers, the unsized layers being treated with an adhesive having penetrative properties containing an abrasive material and adapted to strike through and adhere to the sized layer.

2,226,589. Metal coating and adhesive therefore. William H. Smyers, assignor to Standard Oil Development Company, Linden, N. J. Filed May 12, 1933. 14 claims. (Cl. 154-46). An adhesive (polymerized isobutylene) for laminating a flexible fibrous layer and a metal foil.

2,226,709. Calender finished paper board product and process and means for production or treatment thereof. Charles C. Colbert, assignor to American Coating Mills, Inc., Elkhart, Ind. Filed Feb. 9, 1939. 20 claims. (Cl. 91-14). The calender-finished paperboard having a finished ply is dampened by application of liquid to the back side after it has undergone its final calendering and then dried.

2,226,738. Machine for booking matches. Michael Paridon, assignor to The Diamond Match Company, New York, N. Y. Filed Feb. 21, 1940. 6 claims. (Cl. 93-2).

2,226,841. Paper. Philip S. Barnhart, assignor to Westfield River Paper Company, Inc., Russell, Mass. Filed April 28, 1938. 6 claims. (Cl. 47-29). A plant protector formed of glassine paper treated with an acid fertilizer salt.

2,227,203. Manufacture of soap. Ashton, T. Scott and Charles R. Brown, assignors to The Sharples Corporation, Philadelphia, Pa. Filed Nov. 5, 1938. 10 claims. (Cl. 260-97.5). The process of separating from black liquor a crude tall oil soap mixture, heating the mixture with alkali, and separating impurities from the soaps.

2,227,205. Process of making laminated shingles. James Daniel Tennison, assignor to Tennison Brothers, Incorporated, Memphis, Tenn. Filed Aug. 13, 1937. 1 claim. (Cl. 184-2). An embossed laminated metal-paper shingle.

2,227,212. Laminated material and method of manufacture. Leo Beck, Upper Montclair, N. J., assignor to Catalin Corporation. Filed July 23, 1938. 5 claims. (Cl. 154-2). Thermoplastic resins are used as laminating materials.

2,227,398. Wrapping material measuring device. Harold H. Mohl, assignor to Micro-Westco, Inc., Bettendorf, Iowa. Filed July 14, 1939. 7 claims. (Cl. 93-2).

Tensile Breaking Strength of Paper and Paperboard

Revision of TAPPI Standard T 404 m-36

Apparatus

The instrument used shall have:

(1) Two clamps whose centers shall be in the same plane parallel with the direction of motion of the applied stress and so aligned that they will hold the test specimen in one plane throughout the test without slippage. At the start of the test the edges of the jaws of the clamps shall be 180±10 mm. (7.09±0.04 inches) apart, except that for coarse papers, such as building papers, and for paperboards over 0.012 inch thick, the distance may be from 152 mm. (6.0 inches) to 203 mm. (8.0 inches).

(2) Means of applying a gradually increasing load to the test specimen until it breaks, the increase being such that the additional load applied each second is not different by more than 5% from the additional load applied in the previous second. (This condition is fulfilled by the usual pendulum type of apparatus.)

(3) Means of indicating the applied load at the instant of fracture to an accuracy of within 2%.

Calibration

Level the machine accurately in both the principal directions and clean the mechanism to ensure that it moves freely. Apply various dead weight loads to the clamp actuating the indicating mechanism and note the scale readings when the load and mechanism come gently into an equilibrium position. This can be done conveniently with the pendulum type of tester by wedging up the pawls holding the pendulum with a small piece of paper bent double, suspending the test weights to the upper clamp and allowing the pendulum to come to equilibrium from the direction in which it moves when the load is applied to it. The lower jaw should not be used for supporting the test weights during calibration. Make a record of deviations from the indicated readings and apply corresponding corrections to the test results. In general the calibration of the scale should be checked at three or four widely-spaced points, and if appreciable errors are found, enough calibration points should be used to allow construction of a correction curve.

It is recommended that the instrument shall have been calibrated within one month prior to the test.

Test Specimen

The specimens for test shall be strips cut accurately and parallel to within 0.1 mm. and with clean edges, in each principal direction of the paper, and over 200 mm., preferably 250 mm. (9.9 inches) long. The width shall be 12.7 mm. (0.5 inch), 15.0 mm. (0.59 inch) or 15.9 mm. (0.625 inch), except that for coarse papers, such as building papers, or for paperboards over 0.012 inch thick, the width may be 1 inch or 2 inches. The specimens shall be conditioned according to TAPPI Standard T 402 m.

Procedure

The test shall be made in an atmosphere conditioned according to TAPPI Standard T 402 m. The load shall be applied to each specimen in the following manner until it breaks.

(1) For weak papers such as tissues, paper towels, newsprint, etc., requiring a breaking load of 5 pounds (2.3 kg.) or less, have the machine speed so adjusted that fracture occurs in not less than 5 nor more than 15 seconds.

(2) All other papers, and paperboards, requiring a breaking load of not more than 30 pounds (13.6 kg.) shall be tested at a constant rate of loading of about 1 ± 0.32 pound (0.45 ± 0.15 kg.) per second.

(3) For papers and paperboards requiring a breaking load of more than 30 pounds (13.6 kg.), adjust the machine speed so that fracture occurs in not less than 30 nor more than 45 seconds.

The appropriate rate of loading may be determined from a trial test strip.

Tightly clamp one end of each strip in the upper jaw after placing the strip loosely in the lower jaw and checking its alignment. Then tightly clamp the lower end of the strip and apply the load.

Reject readings from individual strips if the strip slips or breaks in or at the edge of the clamps.

The result of each individual breaking load shall be recorded when possible to three significant figures.

At least 10, and preferably 20, strips cut in each principal direction of the paper shall be tested.

If the mean value of the lowest and the highest reading differs from the average of all the readings by more than 5%, more specimens shall be tested until there is agreement within this limit. In the case of an irregular sheet of paper, it may, therefore, be necessary to conduct a much larger number of tests than 10. An isolated very high or low result, which is not repeated in duplicate, shall be discarded when a consistent average is obtained without the abnormal reading.

Report

Results obtained on strips cut in the machine direction shall be reported as tensile strength, machine direction, and the results obtained on strips cut in the cross direction shall be reported as tensile strength, cross direction.

The average value of the breaking load results shall be reported in kilograms per 15 mm. width, or pounds per inch width, to the nearest 2% of the total reading. The average, maximum, and minimum tensile strength for each of the principal directions of the paper shall be reported.

A complete report requires in addition:

(1) Maximum and minimum results of individual tests and number of strips tested.

(2) A statement of the rate of loading used.

(3) The width of the test specimen.

(4) The length of the test specimen— i.e., the distance between the jaws at the start of the test.

Reproducibility of Results

Duplicate determinations of the tensile breaking strength from different sets of samples from the same shipment and on different instruments are expected to agree within 5%.

Additional Information

If a lesser distance between the clamps is employed, a higher test is usual. For papers which have a poor formation, the difference between 100 mm. and the standard distance of 180 mm. may amount to over 10%. Where a length of strip of 180 mm. is not possible, the machine may be adapted to 150 mm. (6 inches), 100 mm. (4 inches), or 50 mm. (2 inches). If the specimen strips are too short for the tester, they may be extendel by means of strips of strong gummed kraft. In any of these cases, however, the fact should be reported. The distance of 100 mm. is standard for pulp test sheets.

References

(1) A.S.T.M. Bull. no. 87, p. 15 (Aug. 1937).
(2) Carson, F. T., *Paper Trade J.* 102, 19:39 (May 7, 1936); *Tech. Assoc. Papers* 19:172 (June, 1936).
(3) Clark, J. d'A., *Tech. Assoc. Papers* 19:265 (June, 1936).
(4) Griffin and McKinley, *Tech. Assoc. Papers* 19:222 (June, 1936).
(5) Institute of Paper Chemistry, Report no. 29, (Feb. 16, 1940).
(6) Oliver, C. V., *Proc. Tech. Section, Paper Makers' Assoc. Gt. Britain and Ireland* 11:53 (1930).
(7) Paper Makers' Assoc. of Great Britain and Ireland. Tech. Section. *Paper Testing Committee.* First report. London, The Association, 1937. 85 p. *See* volume 18, part 1A, of *Proc. Tech. Section* (June, 1937); also *World's Paper Trade Rev.*, Tech. Convention No., March, 1937: 4-72.
(8) TAPPI, *Tech. Assoc. Papers* 19:271 (June, 1936).

Would End Pulpwood Exploitation

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., January 31, 1941—Mayor C. W. Cox, of Port Arthur, plans to invite the city counsel to visit Wisconsin to see "how U. S. industry is thriving on Canadian resources."

Mayor Cox, who is also liberal member of the Ontario Legislature, for Port Arthur, has just returned from Wisconsin, and has this to say: "I'll show them 15 paper mills there within a radius of 15 miles or so with not a stick of Wisconsin timber in sight, operating at capacity day and night making paper out of stacks and stacks of Canadian wood."

He asserted the timber policy of the Ontario government was responsible for "exploitation" of lakehead resources, and that until the people there demand a halt, exploitation of these resources would continue.

Cuprammonium Viscosity as a Pulp and Paper Mill Control Test

By E. D. Rich[1]

Abstract

A simplified rapid method of testing the cuprammonium viscosity of pulp and paper is used for many types of control and investigation. The test is found to be more satisfactory than bleachability determinations as a guide in blowing digesters for a pulp of uniform quality. It is used throughout the bleaching and papermaking processes to control the degradation of the cellulose and provide data on mill operation and also in the laboratory as a test on finished pulp and paper sheets to determine fiber characteristics.

It has been known for some time that a solution of copper and ammonia would act as a solvent for cellulose. One of the earliest methods of producing rayon and cellulose films was based on this property. There are a number of cuprammonium mills in operation in Europe and at least one mill in the United States. However, the value of this solvent *(2)* as a test for cellulose quality was not discovered until the experiments of Ost *(1)* in 1911. Little is reported of the test until after 1920 when it began to be widely used as a test for cotton and textiles. During the latter part of this decade methods of purifying wood pulp for rayon and cellophane manufacture were developed and the viscosity test was introduced in pulp mills as an essential test for these grades of pulp. Since 1930 the cuprammonium viscosity test has been widely used in pulp and paper mill laboratories in connection with research and special operating studies, but as the testing procedures have been rather complicated and the time required for the test has been at least 20 hours, it has been applied very little as a control test. Considerable research has been directed towards the development of a rapid method of testing for viscosity and a number of tests have been developed which require less than an hour and still maintain a reasonable accuracy. However, all require special equipment and extreme care during testing.

In 1937 a test was developed in which ammonia was used to break up and swell the fibers before the addition of the cuprammonium solvent *(2)*. The pulp dissolves very rapidly (2 minutes or less) and the entire test can be made in less than 15 minutes. The equipment necessary for testing has been greatly simplified thus making it possible for untrained men to make tests with an accuracy of 3%. This procedure was used for all test data in this report.

The meaning of the viscosity of a solution of pulp and cuprammonium is not definitely established as yet. However, it is generally agreed that the viscosity is a measure of the average chain length of the cellulose molecules. Chemical action on the cellulose molecule shortens the chain length and the viscosity test measures the amount of degradation which has taken place in producing the pulp or paper.

[1] Member TAPPI, Technical Supervisor, Oregon Pulp & Paper Company, Salem, Ore.

[2] "There is no true solvent for cellulose. The various "solvents" permit the recovery of a modified cellulose only. On dilution of the solvent, gelatinous cellulose usually precipitates." Schorger, Chemistry of Cellulose and Wood, New York, McGraw-Hill, 1926.

Degradation takes place in cooking, bleaching, and storage during the pulping process. In the paper mill cellulose is degraded by addition of chemicals to the beater, by the action of these chemicals during storage in the machine chest and by oxidation as the paper is dried on the machine. The aging of pulp and paper sheets is a process of degradation readily shown by changes in viscosity. The viscosity test might therefore be compared to an x ray or "inside picture" of the pulp fibers. The test is sufficiently sensitive to indicate decreasing quality before the physical tests show it.

Cooking

At the present time most mills blow their digesters for a certain bleachability test. This test is a measure of the amount of lignin and encrusting material left on the fibers and hence gives no indications of the actual quality of the cellulose.

Different species of wood have different amounts of lignin. The rate or ease of removal of lignin varies with the species. To a lesser degree this is true of wood of the same species cut from different localities or grown under different conditions. Therefore two pulps having the same bleachability may have widely different viscosities: the first pulp may require more drastic cooking to reach the same bleachability as the

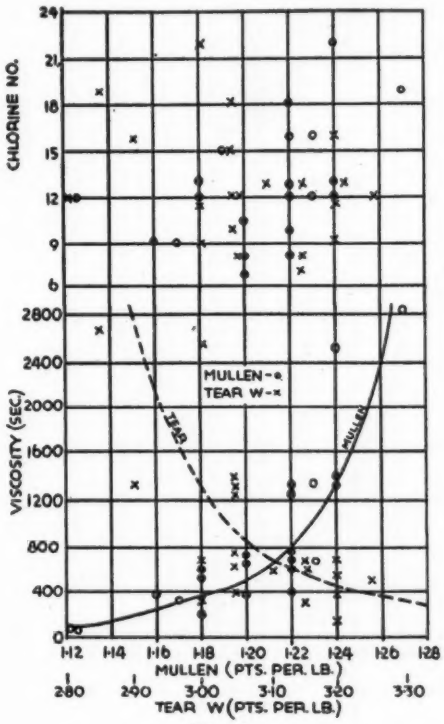

FIG. 1

(Top) Relation between Chlorine No. and Strength
(Bottom) Relation between Viscosity and Strength

second, causing the cellulose of the first pulp to be far more degraded, resulting in low quality paper.

Tests made on numerous cooks prove this to be true. It was found that to obtain the same quality (viscosity) of pulp from white fir as from hemlock it was necessary to blow the digesters at a higher bleachability. Also blowing the white fir cooks at the same bleachability (lower viscosity) resulted in a lower burst (Mullen) and tear in the finished paper. It was observed that hemlock cooks blown to the same bleachability will vary greatly in viscosity, and quality of the finished paper.

The correlation between bleachability and strength characteristics of the finished paper for a 2-day period is shown in Fig. 1. Figure 2 shows the correlation between viscosity and strength tests for the same period. The bleachability test gives little indication of the bursting and tearing strengths while viscosity tests have a fairly definite correlation. The bleachabilities and viscosities of over 50 cooks are shown in Fig. 2. The scattering of the points indicates only a slight relationship between the two tests.

Viscosity control in cooking can be as easily used as bleachability control. Using the procedure given in this report it is possible to run tests on samples from the blowpits as quickly as bleachability tests are now made, giving the cook information from which to blow the next digester. If a more positive control is desired small sample blow lines can be installed on the digesters from which samples may be drawn and a test made before blowing. By running tests during the latter part of the cooking period the rate of drop in viscosity may be determined for various cooking conditions. A test is then made towards the end of the cook and the blowing time set from this result.

Washing and Blending

Viscosity tests made on samples taken before and after washing in the blowpits will show the extent to which the fibers were degraded during this prolonged washing period. Samples taken after any washing and allowed to stand for several days before retesting will show whether the washing was complete as far as the removal of degrading chemicals is concerned.

The efficiency of blending tanks can be conveniently checked by running viscosity tests on the stock running in and out at 10- to 15-minute intervals. Since the viscosity of a mixture of two pulps will closely approximate the average of the two pulp viscosities it is possible to predict the outgoing viscosity for a 100% blending efficiency and compare the actual outgoing viscosity with this. The viscosity of a mixture of two pulps is usually slightly lower than the average viscosities of the pulps. However, this variation is not sufficient to affect the efficiency calculations.

Bleaching

Viscosity tests will indicate the effect of bleaching on pulp fibers better than any other test. By testing the pulp as it enters the bleach plant and testing again after each stage of bleaching the percentage loss or drop in viscosity can be calculated for each operation. This loss should be held to a minimum as an excessive amount will be reflected in paper having lower strength. The viscosity drop during bleaching is quite easily controlled by varying the pH, temperature, or time of bleaching.

To test the effect of varying amounts of sodium hydroxide used in the hypochlorite bleaching stage of a sulphite mill the amount was varied at 12-hour intervals to cover the range from zero to 43 pounds per ton. Viscosity tests were made on the pulp before and after bleaching for each cell. Composites for each range were tested in the laboratory beater and the average burst and tear tests of the paper produced from the pulp were obtained. The results of this test are shown in Tables I and II.

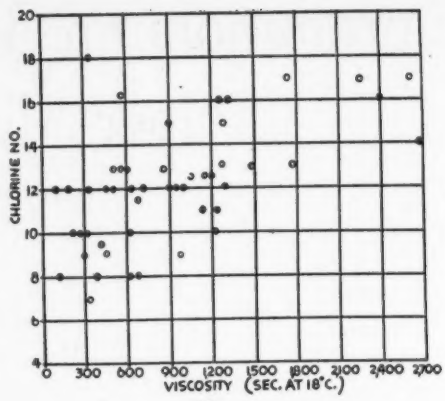

FIG. 2
Relation between Chlorine No. and Viscosity

TABLE I.—EFFECT OF NaOH ON VISCOSITY LOSS

NaOH Used lb./ton	Loss in Viscosity %
0	68.9
10.3	54.2
13.7	44.4
17.2	53.4
20.6	57.2
28.6	65.2
43.0	93.8[1]

[1] This high loss was attributed to the extra bleach and temperature required by this pulp to obtain the same color in the same time.

TABLE II.—EFFECT OF LOSS IN VISCOSITY ON STRENGTH OF PULP

Loss in Viscosity %	Burst %	Tear g./lb.
40	102	1.7
50	100	1.5
60	93	1.3
70	88	1.2
80	86	1.1
90	85	1.1

These data resulted in the use of 12 to 15 pounds of sodium hydroxide per ton as the standard for bleach plant operation in this mill. The use of 12 pounds of sodium hydroxide per ton maintained the pH above 7 for the duration of the bleach, while 15 pounds maintained a pH above 8.

Continuous Test of Viscosity

Continuous testing of the viscosity of the pulp before and after bleaching will provide valuable information on the bleached pulp and on bleach plant operation. An increase in the viscosity loss during bleaching will indicate either a change in bleach plant operation detrimental to the pulp, such as prolonged bleaching time, excessive temperatures, or a change from the proper concentrations of bleach liquor and sodium hydroxide, or a change in the quality of the wood used resulting in cellulose having a poor resistance to chemical action. In either case this change in viscosity relationship is a warning that pulp of poor quality is on the way to the beater room and paper machine, and this knowledge may allow adjustments to prevent the manufacture of off-quality paper.

It was frequently observed that two pulps arriving at the bleach plant with the same viscosity and given

identical bleach treatments will have somewhat different viscosities when leaving. A test was developed in 1938 to indicate this degree of resistance as an aid in bleach plant and mill control *(3)*. In this test a sample of unbleached pulp is obtained and a viscosity test is made on part of it. The balance is quickly bleached under carefully controlled conditions and a second viscosity test made on the bleached pulp. The ratio of these two viscosities, called the *resistance ratio*, can be correlated to actual bleach plant operation if viscosity control is desired there, or will provide advance information on the characteristics of the pulp. The test requires about an hour. The uses and value of this ratio have not been fully explored as yet but the data obtained indicate an interesting future for it.

Beating and Jordaning

There is very little change in viscosity during beating and jordaning of a pulp free from beater furnish, indicating that this test does not record physical degradation of the fiber. However, paper stock containing alum, size, and other furnish usually has a lower viscosity at the wet end of the machine than when the beater was filled. Table III presents data obtained on pulp beaten in the laboratory beater and pulp beaten and jordaned in mill operation.

TABLE III.—EFFECT OF BEATING, JORDANING, AND FURNISH ON VISCOSITY

Test	Beating time min.	Jordan Treatment	Furnish	Viscosity Before	Viscosity After	Viscosity Loss, %
1	70	none	none	225	245	3.9
2	80	none	none	72	70	2.8
3	40	yes	alum, size, filler, & colors	179	169	5.6
4	40	yes	"	162	142	12.3
5	45	yes	"	162	121	25.3
6	40	yes	"	159	137	13.8
7	60	yes	none	84	80	5.0

In making the viscosity test on paper stock most of the paper furnish is removed by centrifuging and washing, therefore the higher viscosity loss in stocks containing furnish is undoubtedly due to acidity caused by the alum. Chemicals are sometimes added in the beater to deliberately soften the pulp. Viscosity tests then are useful in the beater room as an indication of the degradation due to the use of chemicals or low pH, or to control the amount of this degradation if it is desired.

Drying

During the past few years many pulp and paper machines have been run at speeds far in excess of that for which they were originally designed. In many cases this has necessitated an increased drier temperature, resulting in uneven drying and scorching. Oxidation of the pulp or paper sheet, even though not noticeable, will cause brittleness and lower strength characteristics. This oxidation is readily shown by a drop in the viscosity between the stock going to the machines and the finished sheet. A few viscosity tests made under varying drying conditions indicate this (*see* Table IV).

TABLE IV.—EFFECT OF DRYING ON VISCOSITY

Test	Grade	Drier temp. deg. F.	Speed	Viscosity Before	Viscosity After	Viscosity Loss, %
1	Plain no. 5 bond...	244	605	169	158	6.5
2	Plain no. 5 bond...	243	605	142	135	4.9
3	Tub-sized bond.....	265	515	121	93	23.1
4	Tub-sized bond.....	265	515	137	102	25.5
5	Waterleaf	231	450	58	57	1.7

A viscosity test on each reel of paper from the machine will serve as a final check on the entire mill operation. An excessive drop in viscosity between the blowpit and the final pulp or paper sheets indicates that the product is of doubtful quality, provided there has been no major change in operating conditions. Such papers or pulps will age rapidly during storage and may cause complaints when used due to brittleness and lack of strength.

General Mill Control

The use of viscosity testing for controlling pulp and paper mill operation will effect savings which, in some mills, will more than offset the cost of the testing and technical supervision. A mill lacking in adequate control must blow "hard" cooks in order that the occasional mistakes or accidents will not produce off quality paper or pulp. With control it is possible to blow uniform softer cooks and produce a more satisfactory product while obtaining savings in sulphur, chlorine, and lime due to acid recovery and the lower bleach requirements of the pulp. Regardless of the savings however, the main purpose of mill control is to assist the operating department in producing a uniform grade of pulp and paper day after day.

Table V gives the normal operating history of a bond pulp cook from the digester to finished paper as told by viscosity testing:

TABLE V

Test	Sample	Viscosity
1	After 8 hours cooking.....	2350
2	After 9 hours cooking.....	520
3	When blown—9½ hours.....	203
4	Blow pit sample	185
5	Unbleached stock chest.....	172
6	After chlorinator	168
7	After hypochlorite	93
8	Bleached pulp washer.....	86
9	Filling beater	86
10	Beater dropped	82
11	Machine headbox	73
12	Paper from reel.....	67
13	Same paper in finishing room.....	65
14	In storage one month.....	51
15	Oven-aged for 5 hours at 105 deg. C.....	15

A paper mill that purchases pulp for its use must usually depend on the statements of the pulp mill as the only guaranty of uniformity and hardness or softness of the pulp. This is especially true when using bleached pulp which cannot be measured for this characteristic by bleachability tests. As a general rule the paper mill operating men assume that each new shipment of pulp is identical to the last or standard shipment until it is in process and the paper tests show that something is different. A beater curve and viscosity test will indicate clearly when the pulp is off-grade and allow adjustments to be made before it is started in the mill, resulting in higher production and less off-quality paper.

Laboratory Testing

One of the most valuable uses of the test is in the study of paper samples returned with complaints or samples to be duplicated. One frequent cause of complaints is paper which has become brittle and lost its strength during storage. Aging is clearly shown by a drop in viscosity as is shown in Tables VI and

TABLE VI.—NATURAL AGING OF PAPER
(16 lb. no. 5 sulphite bond)

Time, months	Viscosity, sec.	Viscosity Loss, %	Burst (pts.)	Tear W	Tear C
0	93	0	17.5	35	40
1	68	27	...	...	...
3	49	47	16.7	33	40
6	35	62	15.2	30	36
12	24	74	14.5	28	35

VII. Note the extent of the viscosity loss before the physical tests show appreciable deterioration.

TABLE VII.—ARTIFICIAL AGING OF PAPER
(16 lb. no. 5 sulphite bond aged in oven at 105 deg. C.)

Time, hours	Viscosity, sec.	Viscosity Loss, %	Burst (pts.)	Tear W	Tear C
0	93	..	17.5	35	40
1	37	60	...	..	..
2	29	69	14.9	29	36
3	22	76	...	..	..
5	18	81	...	..	..
7	13	86	...	..	..
10	7	93	12.3	23	26
16	6	94	...	..	..
24	4	96	...	..	..
36	3	97	10.1	12	18
48	3	97	...	..	..
72	1	99	9.3	10	13
92	1	99	7.9	7	11

It is a common occurrence in a paper mill to receive a sample of paper to be duplicated, or to be analyzed. After a fiber analysis has been made the next most important question is the degree of hardness or softness of the pulp used. In addition to giving a numerical answer to this question the viscosity test will check the results of the fiber analysis as is indicated in Table VIII of approximate viscosity ranges.

TABLE VIII.—VISCOSITY RANGES OF VARIOUS PULPS

Type	Grade	Viscosity range Unbleached	Bleached
Sulphite	Glassine	3000 to 5000	500 to 1000
	Bond	300 to 1000	45 to 200
	Mimeograph	100 to 500	25 to 125
	Waterleaf	75 to 300	20 to 100
	Rayon	50 to 200	15 to 35
	Cellophane	20 to 50	10 to 15
Sulphate	Glassine	500 to 1500	.. .. ..
	Wrapping and bag	100 to 1000	20 to 100
Soda	Book	5 to 50	1 to 10

A bond paper showing good strength characteristics but a low viscosity (20 to 40 seconds) is probably made from a mixture of bleached sulphate and bleached sulphite. If the paper had fair strength and a low viscosity (10 to 40 seconds) the pulp used was most likely a mixture of bleached soda and bleached sulphite. Paper having a viscosity of 10 seconds or less is usually 100% soda, while papers testing from 60 to 150 seconds are usually 100% bleached sulphite.

Procedure for Viscosity Testing

All of the viscosity results presented in the various tables were obtained from the following procedure. As was mentioned at the start of this report, the test requires little special equipment and does not require a special room. The time required for dissolving the pulp has been standardized at one minute. This rapid dispersion is attributed to the use of acetone for washing (which leaves the dried pulp in a fluffy state) and to the saturation and swelling of the fibers with standardized ammonia before the cuprammonium is added.

This test was originally developed as a control test to be used in conjunction with a standard 20-hour tumbler viscosity test used by many rayon mills and pulp mills producing rayon grades. As the empirical term "seconds" for this test has become fairly well known and used it was decided to express the results of this control testing procedure in the same terms. Hence the temperature correction factors given with the procedure are also conversion factors to express the viscosity in seconds at the standard temperature of 18 deg. C.

Solvent

The solution used for cuprammonium viscosities by this rapid procedure is produced from pure copper wire, ammonia, and sugar. The apparatus and supplies necessary for the production of the solvent are:

Equipment
Refrigerator (with motor and compressor in bottom)
Stainless steel cylinder, 3 inches in diameter and 30 inches long, with stainless steel perforated plate welded 1¼ inches in from one end
No. 14 rubber stopper for cylinder
2—5-gallon glass bottles for ammonia
2—2-gallon glass bottles for solvent
3—1-liter suction flasks
Rubber and glass tubing.

Supplies and solutions
Compressed air
28 or 30 gauge hard drawn copper wire
Ammonia (about 180 grams per liter, containing 12 grams per liter of cane sugar)
Cadmium chloride (saturated solution)
Sodium hydroxide (approx. 10%).

A hole is cut in the top of the refrigerator allowing the stainless steel cylinder to be inserted vertically, the end containing the perforated plate downward, and such that as large an area as possible comes in contact with the cooling unit of the refrigerator. The top end of the cylinder should protrude about one inch above the top of the refrigerator. The large rubber stopper is trimmed on a lathe until it fits snuggly in the end of the cylinder, then fitted with a glass T tube and inserted in the lower end. A piece of rubber tubing about 2 feet long is attached to one tube of the T to drain the cylinder.

The compressed air line should be fitted with a needle valve to regulate the flow. By means of rubber tubing a train of bottles is connected in the air line to wash the air and catch any water or impurities in the air supply. These bottles contain, in order from the needle valve: (1) empty; (2) saturated cadmium chloride; (3) 10% NaOH; (4) empty (or filled with cotton or cheesecloth). After passing through these bottles the air is led into the refrigerator and through tubing making several turns around the cooling unit before entering the cylinder through the remaining arm of the T. It is sometimes necessary to place a Bunsen valve in the line just before the air enters the cylinder to prevent the solution from backing up into the tubing. It is well to place a number of small bottles under each turn of the tubing around the cooling unit, and in the air line, to catch the condensate from the air.

The cylinder is filled with the clean copper wire, which has been cut in 2-inch lengths, a copper rod being used to tamp it down. The ammonia-sugar solution is then poured in to within 3 inches of the top and (when cool) a gentle stream of air is turned on. By means of a second rubber stopper and tubing the ammonia fumes from the top of the cylinder may be removed outside the laboratory.

After the air has been bubbling through the solution for about 3 hours a sample should be obtained and tested for copper. When the copper strength is about 45 grams per liter the air is shut off and the cylinder drained into a 2-gallon bottle. The cylinder should be immediately refilled with ammonia-sugar solution. After several batches have been made more copper wire will have to be added.

Standardizing the Solution

Three batches of solution will nearly fill the 2-gallon bottle, and it is now ready for standardizing. Both before and after standardizing the solution must be stored in the refrigerator.

Reagents
Sulphuric acid, approx. 2 *N*
Potassium iodide, saturated solution
Sodium thiosulphate, 0.050 *N*
Hydrochloric acid, 1.000 *N*
Ammonia, 167 grams per liter, containing 12 grams per liter of sugar.

Shake the bottle of solution thoroughly and test for copper and ammonia as follows:

A 1-cc. sample is pipetted into a small beaker containing about 10 cc. of 2 *N* sulphuric acid. Saturated KI is added until the solution clears (cuprous iodide held in solution) and then the iodine is titrated with 0.050 *N* sodium thiosulphate to a colorless end point.

cc. $Na_2S_2O_3X$ 3.175 = grams/liter copper.

The final copper concentration should be 40.0 ± 0.5 grams per liter.

A 2 cc. sample is pipetted into about 18 cc. of normal hydrochloric acid and the titration completed (with the 1.000 *N* HCl), using methyl orange indicator.

cc. HCl × 8.5 = grams per liter of ammonia.

The total alkalinity, expressed as ammonia, must be adjusted to 167.0 ± 0.5 grams per liter.

Standardized ammonia and distilled water should be used in diluting to standard concentrations. At all times the solvent should be stored in a cold dark place and any bottle showing evidence of cuprous oxide precipitation should be discarded.

Viscosity Testing

Apparatus and Supplies
- Large Buchner filter funnel
- 2-liter suction flask
- Vacuum service
- Acetone (commercial)
- Model 270 Moisture Teller, (Harry W. Dietert Co., 9330 Roselawn Avenue, Detroit, Mich.)
- Balance (sensitivity—10 milligrams)
- 250-cc. Erlenmeyer flasks
- 75-cc. measuring pipet with 3-way stopcock
- 100cc. measuring pipet with 3-way stopcock
- Ammonia (standardized to 167.0 ± 0.5 grams/liter plus 12 grams per liter of sugar)
- Cuprammonium solvent
- Glass tubes, (1 foot long and 1 inch diameter, having stopper in one end)
- Reading cabinet (box containing bank of lights backed by a reflector, total wattage of about 300. The light is shielded except for a slit ½ inch wide and 11 inches high. The tubes are set on a pedestal in front of this slit and held in place by a gate which has parallel sets of wires across it horizontally at 0, 5, 10, and 20 centimeters).
- Standardized aluminum balls (0.125 ± 0.001 inch in diameter and 0.0474 ± 0.005 grams in weight; obtained from Hoover Ball and Bearing Co., Ann Arbor, Mich.)
- Stopwatch
- Thermometer, (range 0 to 100 deg. C.)

The procedure, assuming the pulp is in a slush state, is as follows:

1. If necessary wash the pulp in a tray and, if unscreened, pick out the larger knots and shives. 2. Press out most of the water, then slush in acetone-water filtrate from previous tests. 3. Pour into a Buchner filter, suck dry and wash twice with acetone. 4. Peel the pulp gently into thin pieces and place in a drying pan. 5. Dry from 3 to 4 minutes in the Moisture Teller (96% moisture-free). 6. Weigh out 3.50 ± 0.01 grams of moisture-free pulp and place in a 250-cc. flask. (3.65 grams at 96%). 7. Measure out 75 cc. of standardized ammonia in the pipet and drain into the flask. 8. Stopper and shake vigorously for about a minute. 9. Measure out 100 cc. of cuprammonium solvent in the second pipet and drain into the flask. 10. Stopper and *shake vigorously* for exactly 60 seconds. 11. Fill a reading tube to within ¼ inch of the top with this solution and place in the reading cabinet. 12. Place a thermometer accurate to 0.1 deg. C. in the solution remaining in the flask. 13. Drop an aluminum ball in the top of the reading tube and take the time in seconds for the ball to pass through 20 cm. of solution (from top to bottom set of wires). 14. Read the temperature of the solution and correct the stopwatch reading to viscosity.

The temperature correction and conversion factors to record the viscosity in terms of the tumbler test at 18 deg. C. are:

Temperature deg. C.	Factor
12	1.40
14	1.63
15	1.73
16	1.82
17	1.91
18	2.00
19	2.09
20	2.18
21	2.28
22	2.38

A skilled operator can run duplicate tests checking within 1.5% by this test. There are a large number of factors which can enter into and alter viscosity testing and it would be well for any person who intends to use the test to familiarize himself with these *(4)*. The best safeguard to prevent variations due to personal error and changes in solvent strength, room temperature, etc., is to have on hand a standard viscosity pulp sample prepared according to the directions given later on and run two or three tests on this sample with each set of viscosity tests; or at each testing change, such as change of testers or solvent, if tests are being made continuously. The viscosity tests are then corrected proportionally for the amount the viscosity of this standard varies from normal.

For precision testing a moisture determination should be made on part of the sample after drying and the viscosity result corrected for variations from normal. A variation in moisture gives a variation in concentration and may be corrected by the formula given in the latter portion of this report.

Conversion of Viscosity into Centipoises

The standard viscosity as given by this procedure (after correction by the temperature factors) is an empirical number representing the number of seconds for a standard aluminum ball to pass through 20 cm. of a 2.5% solution at 18 deg. C. (Standard solvent: 30.5 grams per liter of copper and 165 grams per liter of ammonia.) To compare these results with those given by the TAPPI procedure it is necessary to convert them into centipoises. Work on a complete conversion table is progressing at the present time. Table IX gives a tentative correlation prepared from tests made by the two procedures on 12 pulp samples.

TABLE IX

Viscosity at 18 deg. C. sec.	Viscosity in centipoises at 20 deg. C.
0	0
10	4.5
30	13.5
80	36.0
150	67.5

Standard Viscosity Sample

In spite of all the care and precautions that are taken in preparing the cuprammonium solvent and in testing variations will occur in the results from day to day that may cause errors up to 10%. It is therefore advisable to have a standard pulp sample and run check viscosity tests on it each day that tests are made or when starting a new bottle of solvent. If this viscosity varies from normal a proportional correction is applied to all tests made at the same time. In practice it has been found that the use of such a standard viscosity sample will reduce error in testing from day to day and in testing between testers and between laboratories to less than 1%.

The standard sample should be a highly purified, bleached pulp sample, having a viscosity near the middle of the usual viscosity testing range. The sample is cut into squares and stored in large glass bottles. Part of this sample is slushed in acetone or water and tested along with each set of tests. Frequent moisture determinations should be made on the pulp after drying in the Moisture Teller to indicate any large variations in moisture.

It should be remembered that even a carefully prepared sample will gradually deteriorate (drop in viscosity) and a new sample should be prepared at least 3 times a year. The new sample should be stored for one month before standardizing. In standardizing the new sample against the old one the corrections which were applied during the past month should be averaged and if the standard is found to be con-

sistently low the old sample viscosity should be considered to have changed to this extent. The new sample is then standardized to this new viscosity for the old sample.

Concentration of Pulp to Solvent

Mills producing hard sulphite, sulphate, or soda pulps will find this test unsuitable unless the concentration is changed to provide readings taking from 25 to 200 seconds. Several samples of bleached soda pulp were recently received for testing. The method of bleaching had been varied for each and it was desired to find out which bleaching method was preferable. Tested by the standard procedure the viscosity of all the samples came out 3 seconds. However, by increasing the consistency to 4.57% the viscosities were raised to a point where they could be easily read and the results indicated the better method of bleaching as shown in Table X.

TABLE X

Bleaching Time, min.	Viscosity 2.5%	Viscosity 4.57%
30	3	62
75	3	51
135	3	42

This is equally true of high viscosities. When the readings take more than 200 seconds, error is introduced due to the heating up of the solution in the reading tube and due to oxidation of the cellulose. Hence if the majority of the readings are in this high range it is suggested that the tests be made at a lower consistency (1.0 to 1.5%) and the results converted to standard.

Doree *(5)* gives an equation for converting viscosities obtained at one concentration into those for another. This formula has been used in making up conversion charts and these charts have compared very favorably with actual tests made on the same pulp sample at the different concentrations:

"As it is not always possible to use a solution containing the standard amount of cotton, some means of calculating the viscosity of a standard solution from data given by a, more or less, concentrated solution is required. Joyner*(6)* has given a formula which is a simplification of that of Kendall*(7)*. Kendall's equation, however, may be written so as to be applicable directly to solutions made by adding a varying weight of cotton to a constant volume of solvent. It then becomes

$$1 + C/m = B/\log (V/V_B)$$

where m is the weight of dry cotton dissolved in 100 cc. of solvent, V the observed viscosity and V_B the viscosity of the cuprammonium solvent . . . and B and C are empirical constants. If $1/m$ is plotted against $1/\log (V/V_B)$, the graph should be a straight line. The measurements of Farrow and Neale show this to be so between the ranges of concentration of 1.5 and 3%. By using the values of B and C read off from the graph, log V may be calculated for any value of m. The formula is certainly valid over a wide range of concentrations."

"To use this relation for evaluating the viscosity at a standard concentration, the value of B may be taken as 11 without serious error. Two equations are then obtained:

$$1 + C/m = 11 \log (V_m/V_B)$$

and

$$1 + C/n = 11 \log (Vn/V_B)$$

where m is the weight of the cotton in the solution used whose viscosity is Vm, V_B is the viscosity of the solvent used, and n is the weight of cotton in a solution of standard concentration whose viscosity, Vn, it is desired to calculate. These may be solved graphically or agebraically."

For the value of V_B in these equations Doree gives 0.0152 c.g.s. units, which is undoubtedly based on solvents having a low copper concentration. The value for the solvent used in this test was found experimentally to be 0.0554. The equations then become:

$$\text{and} \quad m\,[\log (V_m/.0554)] + C\,[\log (V_m/.0554)] = 11\,m$$
$$n\,[\log (V_n/.0554)] + C\,[\log (V_n/.0554)] = 11\,n$$

where the value of C for any one viscosity range may be caluclated from

$$C = [11\,m - m \log (V/.0554)] \div \log (V/.0554)$$

The value of V in this last equation is arbitrarily varied over the range desired and various values for C obtained. These values are then used in the equations, being changed as V_m changes.

Another quite satisfactory method of establishing conversion ratios for different concentrations is given by Barber and Minor *(8)*. This method was used to prepare the conversion table for high viscosity unbleached pulp given in Table XI.

TABLE XI.—CONVERSION TABLE FOR COOK VISCOSITIES

Converting readings at concentration of 1.37% (or weighing out 2.40 grams moisture-free pulp) to 2.00% (or weighing out 3.50 grams moisture-free). In using this table the reading using the 2.40-gram weight is converted to the corresponding reading at 3.50 grams, which is then corrected for temperature as given in the standard procedure.

Reading 2.4 g.	Reading 3.50 g.	Reading 2.4 g.	Reading 3.50 g.	Reading 2.4 g.	Reading 3.50 g.
2	9	26	218	50	610
3	15	27	230	51	633
4	21	28	243	52	656
5	27	29	255	53	682
6	33	30	268	54	708
7	39	31	281	55	738
8	45	32	295	56	768
9	53	33	310	57	803
10	62	34	326	58	838
11	70	35	342	59	876
12	79	36	359	60	915
13	88	37	374	61	957
14	95	38	390	62	1000
15	103	39	406	63	1046
16	112	40	423	64	1093
17	125	41	439	65	1144
18	133	42	456	66	1196
19	144	43	474	67	1256
20	153	44	492	68	1316
21	163	45	510	69	1385
22	173	46	529	70	1455
23	185	47	548	71	1525
24	196	48	568	72	1595
25	207	49	589	73	1670

Other Testing Conditions

The testing procedure assumes that the pulp samples to be tested are in slush form and free of chemicals and beater furnish. Pulp in sheet form, paper, and heavily loaded stock need special preparation before the test can be made.

Pulp in Sheets. Cut about 10 grams of the pulp into ½ inch squares and thoroughly slush in water, using a vigorous electric mixer.

Paper. Cut or tear about 15 grams of the paper into small pieces and slush in the mixer for 5 minutes. Centrifuge and mix again for 2 minutes. Repeat until the discharge from the centrifuge runs clear, then slush the pulp in acetone filtrate from other washings and wash in the Buchner funnel.

Paper Stock. Dilute a cup full of the stock and mix; centrifuge and mix as for paper, the mixing period not being as long.

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Prescribe Uniform Type of Newsprint

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 29, 1941—The Swiss Federal Department of Economy prescribed regulations for the manufacture and utilization of a uniform type of newsprint by virtue of a decree dated October 25, 1940. Effective November 1, only one type of newsprint made in accordance with Government specifications may be manufactured. Newsprint already produced may still be sold and used. This measure is calculated to effect economy in raw materials and fuel.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 1, 1941

SUMMARY

Cigarette paper.....301 cs.
Stencil paper.....6 cs.

CIGARETTE PAPER

E. F. Pipe & Co., ——, Barcelona, 140 cs.
Standard Products Corp., ——, Marseilles/Martinique, 52 cs.
Champagne Paper Corp., ——, Marseilles/Martinique, 55 cs.
——, ——, Marseilles/Martinique, 54 cs.

STENCIL PAPER

American Indicator Paper Co., ——, Kobe, 6 cs.

RAGS, BAGGINGS, ETC.

Tradesmans National Bank, ——, Callao, 136 lbs. cotton waste.
Green Textile Associates, ——, Shanghai, 250 bls. picker waste.
C. Comiter, ——, Shanghai, 100 bls. cotton waste.
M. Granatstein & Son, ——, Buenos Aires, 30 bls. woolen clippings, 31 bls. old knits, 4 bls. rags.
——, ——, Buenos Aires, 17 bls. new cuttings.
M. Sigal & Son, ——, Buenos Aires, 7 bls. paper stock.
Castle & Overton, Inc., ——, Buenos Aires, 3 bls. new hemp threads.
Duncan Fox & Co., ——, Cristobal, 10 bls. cotton waste.

OLD ROPE

——, ——, Cristobal, 2 bdls.

CASEIN

American Cyanamid & Chemical Corp., ——, Buenos Aires, 417 bags, 25,020 kilos.
Casein Co. of America, Inc., ——, Buenos Aires, 1,700 bags, 102,000 kilos.
National City Bank, ——, Buenos Aires, 834 bags, 50,040 kilos.
Chemical Bank Trust Co., ——, Buenos Aires, 834 bags, 50,040 kilos.

NEW ORLEANS IMPORTS

WEEK ENDING FEBRUARY 1, 1941

Juarez Mercantile Corp., ——, Barcelona, 17 bdls. paper.

LOS ANGELES IMPORTS

WEEK ENDING FEBRUARY 1, 1941

Pan Pacific Importers, Ltd., ——, Yokohama, 14 bls, 1 cs. paper.
——, ——, Ocean Falls, 1,866 rolls newsprint.
——, ——, Kobe, 10 cs. transparent paper.

Norwood Pulp Reclaimer

The new Norwood Pulp Reclaimer and a process of pulp reclamation which is said to be based on entirely new principles, has just been announced by the Norwood Pulp and Machinery Company, 234 Boylston street, Boston, Mass.

The Norwood pulp reclaimer is a self-contained unit, designed for batch production and functions as a soak chest, chemical extractor, defibering machine and flotation washer. Each unit has a capacity of 500 pounds per hour and consists of a circular tank, open at the top, with pipe connections. Within this tank is an open-top wire basket, lined with Fourdrinier wire. Inside the basket are sets of rotating and static, vertical friction paddles. The equipment is driven through a motorized speed reducer mounted on a platform on top of the tank. It may be arranged for belt drive from a line shaft in the mill, if desired. The tank of the unit is eight feet in diameter and a space 12 feet square is required for each unit.

The Norwood pulp reclaimer is stated to be easy to operate with perfect control, the Norwood process taking the ink off the paper and does not beat it into the fibers. Pulp is in suspension at any desired consistency and a small investment is required. Further details of the advantages of this equipment are given in the folder issued by the company.

Penn Paper Stock Co. Moves

PHILADELPHIA, Pa., February 3, 1941—On Friday, January 31st, the Penn Paper and Stock Company moved into its new warehouse at 1112-1118 Washington avenue, after having been located for some years at 1025-1031 North Front street. The new location, in the center of the city affords 100,000 square feet of floor space, together with railroad sidings and new separate office building in close proximity of water facilities. Large new and additional equipment has been installed to make the company's plant one of the most modern paper stock establishments. The new telephone numbers are Dewey 0500 on the Bell System, and Race 4041 on the Keystone system.

The Penn Paper and Stock Company founded in 1903 by the late William J. McGarity, is one of the leading waste paper concerns, with branches in Baltimore and Washington. David M. Dickson manages the business.

William Lemly Moves

PHILADELPHIA, Pa., February 3, 1941—William Lemly one of the pioneer waste paper dealers in Philadelphia, has moved from 307 Cherry street to new quarters at 1110-1120 Buttonwood street, Philadelphia, where he occupies 50,000 square feet of floor space and has improved and added facilities. The new telephone number is Stevenson 3844. Mr. Lemley was at the Cherry street address for the last seventeen years; his business has been established since 1895.

New York Paper and Pulp Market Review

Paper Market Indicates More Firmness and Signs of Increasing Activity In Sulphite Bonds, Book and Some Groundwood Lines—Kraft Wrapping Demand Good—Other Markets Unchanged.

Office of the PAPER TRADE JOURNAL,
Wednesday, February 5, 1941.

The wholesale paper market is reflecting signs of increasing firmness. Reports received from many manufacturers' representatives, jobbers, and general paper merchants during the current week indicate that sales in many lines vary from moderate to moderately good, the major activity being reported in kraft wrapping paper.

The index of general business activity declined to 123.6% for the week ended January 25, from 123.7% for the preceding week, compared with 107.4% for the corresponding week for 1940.

Paper production of 241 mills for the week ended January 25 was estimated at 87.9%, compared with 91.7% for 1940, with 79.8% for 1939, with 68.1% for 1938 and with 90.1% for the corresponding week for 1937.

Paper board production for the week ended January 25 was 78.0%, compared with 75.0% for 1940, with 68.0% for 1939, with 60.0% for 1938 and with 81.0% for the corresponding week for 1937.

As many grades of paper and paper products are now considered essential, the per capita consumption of paper continues to steadily increase. In 1940, per capita consumption rose to 253 pounds, from 242 pounds in 1939. The per capita consumption was 221 in 1929. In contrast, the per capita consumption of newsprint has shown a slow decline from a high of 62 pounds per capita in 1929 to 56 pounds in 1940. The immediate outlook in terms of paper is good because of the wide utility of its many products and it stands to benefit by the rising tide of general business activity.

Trade reports this week indicate the paper market, in general, is a little more firm in some lines. Prospects for improvement in many lines is favorable. Sales in general are fair, but reports from many quarters indicate the expectation of a moderate increase in demand within a few weeks. The conservative dealer opinion in reference to the future appears to forecast only a moderate increase in domestic paper consumption, of around 6% average for the entire current year.

Kraft wrapping paper and some of the miscellaneous lines of paper board appear favorably situated at this date. Prices are a little more firm and continue at relatively low levels, compared to pulp, other raw materials and total costs. A considerable part of trade opinion reflects the belief that any marked increase in demand will readjust prices moderately upward to a more equitable level. No important change in paper or board prices has been reported at this date.

Mechanical Paper

No important change in the market situation of mechanical pulp has been reported this week. Prices are unchanged at prevailing market quotations on domestic and Canadian groundwood pulp.

Chemical Pulp

No change in prices or demand has been reported in any grade of chemical pulp during the week. The price situation is relatively stable and in view of the prospect of little improvement for sometime in the foreign wood pulp situation, together with a good domestic demand, a lower price level can scarcely be expected.

Rags

No important change in the rag market has been reported this week. Prices hold unchanged, with little firmness reported in this market.

Old Rope and Bagging

Old rope quotations continue unchanged and are firm under the influence of a steady demand for Manila rope, and a fair and somewhat spotty demand for other grades.

Trading in old bagging is reported fair in some quarters of the trade. No important changes from prevailing market quotations has been reported to date.

Old Waste Paper

The only firm spots in the paper stock market at this date are in the lower grades, which are firm, while the balance of the market is rather soft. This is reflected in the upward adjustment of prices on strictly folded news, currently quoted at from .55 to .60, and on No. 1 waste paper, currently quoted at from .35 to .40.

Twine

No important change in prices or demand has been reported in the twine market during the week. Imported fibers are firm, with less strength in domestic grades.

Buys Paper Under Walsh-Healey Act

WASHINGTON, D. C., January 29, 1941—During the week ended January 11, the Government purchased $39,705.40 worth of paper and allied products under the Walsh-Healey Act as follows: $10,020.00 worth templet paper for Norfolk Navy Yard from The West Jersey Paper Manufacturing Company, Camden, N. J.; $17,395.00 worth of templet paper for Navy, S&A from the West Jersey Paper Manufacturing Company, Camden, N. J.; and $12,290.40 worth of mimeograph papers for War, QMC, Indiana from Century Paper Company, Indianapolis.

Garrett-Buchanan Elect Officers

PHILADELPHIA, Pa., February 3, 1941—At the annual meeting of Garrett-Buchanan Company held this past week the following were re-elected for the year 1941: Morgan H. Thomas, president; George W. Weaver, vice-president and general manager; Frank H. Seltzer, vice-president and assistant manager; J. Elwood Thomas, treasurer, and Joseph H. Miller, secretary.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, February 5, 1941.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is currently quoted at $50 per ton, f.o.b., works. Demand reported moderate for the week.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand reported steady for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are firm, with prices unchanged for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 13 cents per pound; 80-100 mesh, at 13½ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh, is currently offered at 12¼ cents per pound. No quotations on French casein.

CAUSTIC SODA—Quotations on caustic soda are firm and continue unchanged at prevailing market prices. Shipments reported steady. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Market firm. Demand reported good for the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with prices higher on some grades. "G" gum rosin is currently quoted at $1.65 per 100 pounds, in barrels, Savannah "FF" wood rosin is currently quoted at $1.65 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.40 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm and nominal. Shipments steady. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16.50 per ton on imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported moderate for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and continue unchanged for the current week. Pearl is currently quoted at $2.95 per 100 pounds; powdered starch at $3.05 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported moderate for the current week. The commercial grades are currently quoted at $1.15; iron free at $1.60 per 100 pounds. All prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Lt. Chip	52.50	"	55.00
White Pat. Coated	65.00	"	67.50
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items.
Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	" 36.50	32.20	" 37.75
85% Rag	....	"	29.90	" 35.00
75% Rag	23.60	" 27.75	24.75	" 29.00
65% Rag	....	"	21.65	" 26.25
50% Rag	17.55	" 21.50	18.70	" 22.75
25% Rag	14.65	" 17.75	15.80	" 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items.
Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$9.35	@ $11.50	$11.55	@ $12.75
No. 2	8.50	" 10.25	9.65	" 11.75
No. 3	8.05	" 9.25	9.20	" 11.25
No. 4	7.70	" 9.50	8.90	" 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—	
Moist	No prices
Dry	No prices

(Delivered)

No. 1 Domestic and Canadian	40.00	@ 42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75
News Grade, delivered			
Unbleached Sulphite	58.00	"	63.75

(On Dock, Atlantic Ports)

Kraft Bleached	4.12½	"	—
Kraft Light & Strong	3.50	"	3.90
Kraft No. 1	3.40	"	3.80

(F. o. b. Pulp Mill)

Kraft Domestic and Canadian	2.75	"	3.37½

(Delivered)

Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.50	@	6.75
Silesias No. 1	4.50	"	4.65
New Unbleached	6.25	"	6.50
Blue Overall	4.15	"	4.50
Fancy	3.25	"	3.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.00	"	3.15

Old Rags

White, No. 1—			
Repacked	3.50	"	3.65
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	1.50	"	1.65
Miscellaneous	1.10	"	1.25
Roofing Rags—			
No. 1	1.15	"	1.20
No. 2	1.00	"	1.05
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	2.50	@	2.75
Wool Tares, light....	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging	2.25	"	2.50
Manila Rope—			
Foreign	5.25	"	5.50
Domestic	5.25	"	5.50
Jute Threads.....	2.75	"	3.00
Sisal Strings	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	"	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book...	.80	"	.85
Crumbled No. 1...	.70	"	.75
Ledger White Stock.	1.60	"	1.70
Ledger Stock Colored	1.20	"	1.30
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine Compressed bales..	1.40	"	1.50
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue..	.70	"	.75
Strictly Folded....	.55	"	.60
Corrugated	.45	"	.50
No. 1 Mixed Paper..	.35	"	.40

Twines

(F. o. b. Mill)

(Soft Fiber)			
Coarse Polished—			
India	.18	@	—
White Hemp.....	.18	"	—
Fine Polished—			
Fine India	.22	"	—
Unpolished—			
Box	.16	"	—
Paper Makers.....	.13	"	—
Tube Rope.....	.14¾	"	—
Wall Paper.....	.16	"	—
Wrapping	.16	"	—
Soft Fiber Rope...	.14	"	—
Cotton	.24	"	—
(Hard Fiber)			
Medium Java.....	.10	"	—
Mex. Sisal	.09½	"	—
Manila	.23	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1.	.07	@	.07¼
New White No. 2.	.03½	"	.04
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04
Black Silesias, soft	—	"	.03
New Unbleached..	.06	"	.06¼
Washable Prints...	.02¼	"	.02½
Washable No. 1..	—	"	.01½
Blue Overall.....	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01½
Fancy Percales....	—	"	.03
New Black Soft...	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.03¾
No. 2 Mixed.....	.01¾	"	.02
Corduroy	.01¼	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¼

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	"	3.00
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....	Nominal		
Domestic No. 1...	1.30	"	1.35
Domestic No. 2...	1.10	"	1.15
Roofing Bagging..	1.00	"	1.05

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	Nominal		
Domestic	2.25	@	2.50
Manila Rope.....	—	"	5.50
Sisal Rope.....	2.00	"	2.25
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	2.55	"	2.75
No. 2.....	—	"	1.50
Wool Tares, heavy..	3.75	"	4.00
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	2.25	"	2.50

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.40	@	2.50
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White.	1.90	"	2.00
No. 2 Soft White.	1.60	"	1.75
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	1.50	"	1.60
Ledger Stock, colored	1.10	"	1.15
No. 1 Books, heavy..	.80	"	.85
Manila Cuttings.....	1.75	"	1.80
Print Manila.....	.50	"	.55
Container Manila....	.40	"	.45
Kraft Paper.....	1.25	"	1.30
No. 1 Mixed Paper..	.25	"	.30
Straw Board Chip...	.30	"	.35
Binders Board Chip..	.30	"	.35
Corrugated Board...	.50	"	.60
Overissue News.....	.70	"	.75
Old Newspapers.....	.50	"	.55

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.00	@	3.25
No. 1 Soft White	2.75	"	2.50
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Mixed Ledgers.....	1.50	"	1.75
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, Light..	.75	"	.85
Crumpled Stitchless Book Stock	.75	"	.85
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.40	"	1.50
No. 1 Kraft.....	1.25	"	1.30
Extra No. 1 Kraft..	1.45	"	1.50
Mixed Papers.....	.30	"	—
Print Manila	.55	"	.60
Container Manila....	.60	"	.70
Old Newspapers.....	.50	@	.55
Paper Wool Strings.	.95	"	1.10
Overissue News.....	1.00	"	1.10
Box Board Chips....	.40	"	.45
Corrugated Boxes...	.45	"	.50
Kraft corrugated boxes	.85	"	.95
New Kraft Corrugated Cuttings	1.35	"	1.40
Screening Wrappers.	.70	"	.80

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	3.00	"	—
Domestic	2.80	"	3.00
Sisal Rope.....	2.90	"	3.00
Mixed Rope	.85	"	1.00
Transmission Rope—			
Foreign	2.50	"	2.75
Domestic	2.75	"	2.90
Soft Jute Rope.....	3.50	"	3.75
Manila Rope—			
Foreign	5.25	"	5.35
Domestic	5.50	"	5.75
Jute Carpet Threads	2.00	@	2.25
Bleachery Burlap....	4.00	"	3.25
Scrap Burlap—			
Foreign	2.60	"	2.65
Domestic	2.60	"	2.75
Scrap Sisal.....	2.75	"	3.00
Scrap Sisal for Shredding	2.90	"	3.25
Wool Tares—			
Foreign	2.70	"	2.80
Domestic	2.50	"	2.60
Aust. Wool Pouches.	2.75	"	3.00
New Burlap Cuttings	3.75	"	4.00
Heavy baling bagging	2.75	"	3.00
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.04	"	.04¼
New White No. 1.	.06¾	"	.07
New Light Flannelettes	.05	"	.05¼
Canton Flannel, Bleached	.0635	"	.0650
Underwear Cutters, Bleached	.06	"	.0635
Silesias No. 1.....	.05	"	—
New Black Silesias..	3.00	"	3.25
Red Cotton Cuttings	.04	"	.05
Soft Unbleached...	.06	"	.06½
Blue Cheviots.....	.04¼	"	.04½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04¼	"	.04¾
New Black, Soft..	.03	@	.03¼
Khaki Cuttings....	.02½	"	.03
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.06¾	"	.07¼
New Canvas.....	.06¾	"	.07¼
B. V. D. Cuttings...	.06½	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	2.75	@	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	2.00	"	2.25
Old Blue Overalls...	1.60	"	2.00
Thirds and Blues....	1.50	"	1.75
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.20	"	1.30
No. 2.....	.95	"	1.00
No. 3.....	.85	"	.95

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....	(nominal)		
Dutch Blues.....	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians.....	(nominal)		
Old Linsey Garments.	(nominal)		
New Silesias.....	(nominal)		

CHICAGO

Waste Paper

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.10
Blanks	1.50	"	1.60
Krafts	1.40	@	1.50
New Kraft Cuts....	1.60	"	1.75
Overissue News.....	1.00	"	1.10
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.40	"	.50
Roofing Stocks—			
No. 1.....	.95	"	1.00
No. 2.....	.85	"	.90

George O'Brien Heads Loggers' Assn.

VANCOUVER, B. C., January 31, 1941 — George O'Brien Logging Company, operating in the Stillwater country near the big pulp and paper town of Powell River, B. C., has been elected as the new chairman of the British Columbia Loggers' Association. He succeeds C. Dewey Anderson, head of the Salmon River Logging Company.

The new vice-chairman is Robert McKee, managing director, Pioneer Logging Company, operating at the north end of Vancouver Island.

Directors for 1941 are Fred B. Brown, of B & K Logging Company; C. J. Culter, Industrial Timber Mills and Hammond Cedar Company; Roger Cobb, Elk River Timber Company; Norman English of Wood & English; W. J. Van Dusen, Alberni Pacific Lumber Company; Russell Mills, Malahat Logging Company; R. J. Filberg, Comox Logging Company; D. C. Anderson, Salmon River Logging Co.; S. G. Smith, Bloedel Stewart & Welch; Phil A. Wilson, Merrill Ring Wilson Ltd. R. V. Stuart was reappointed as secretary-manager of the association.

George Cobean Becomes Partner

George G. Cobean, president of Bulkley, Dunton, Inc., the export company formed by Bulkley, Dunton & Co., 295 Madison avenue, New York, last October to handle the foreign business of the company, has become a partner of Bulkley, Dunton & Co., as of January 1, 1941.

Mr. Cobean, a former president of the National Paper Trade Association and formerly vice-president of the Butler Paper Company, is now in South America but expects to return to attend the annual convention of the paper industry to be held at the Waldorf-Astoria, New York, February 17-21.